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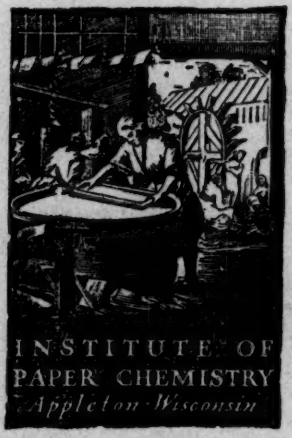
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

FEBRUARY · 1951

Volume 21 Number 6

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The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912.

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Books and Pamphlets Added to the Library During January

ALMANACS

The WORLD ALMANAC and book of facts for 1951. 66th year of publication. Ed. by Harry Hansen. New York, New York World-Telegram Corp., c1951. 912 p.

CARBOHYDRATES

ADVANCES in carbohydrate chemistry. Ed. by Claude S. Hudson [and] Sidney M. Cantor. Associate editors for the British Isles, Stanley Peat [and] Maurice Stacey. New York, Academic Press, 1950. v. 5. 322 p.

CHEMICAL ENGINEERING

ZIMMERMAN, O. T., and LAVINE, IRVIN. Chemical engineering costs. Dover, New Hampshire, Industrial Research Service, 1950. 419 p.

CHEMICAL TESTS AND REAGENTS

HOPKIN & WILLIAMS LTD. *Research Laboratory Staff.* Organic reagents for organic analysis [2d ed.] Brooklyn, Chemical Publ. Co., 1950. 263 p.

CHEMISTRY—YEARBOOKS

SOCIETY OF CHEMICAL INDUSTRY. Reports on the progress of applied chemistry. London, The Society [1950] v. 34, 1949. 928 p.

COLLECTIVE BARGAINING

FLEMING, R. W., and WITTE, EDWIN E. Marathon Corporation and seven labor unions; a case study. [Case study no. 8 prepared for the NPA Committee on the Causes of Industrial Peace under Collective Bargaining] Washington, National Planning Association [1950] 65 p.

CONSERVATION OF RESOURCES

FRANK, BERNARD, and NETBOY, ANTHONY. Water, land, and people. New York, Knopf, 1950. 331 + 11 p.

UNITED NATIONS SCIENTIFIC CONFERENCE ON THE CONSERVATION AND UTILIZATION OF RESOURCES, 17 August-6 September, 1949, *Lake Success, New York.* Proceedings. Volume 1, Plenary meetings. Lake Success, United Nations. Department of Economic Affairs, 1950. 431 p.

DISSERTATIONS, ACADEMIC

DOCTORAL DISSERTATIONS accepted by American universities 1949-1950 (number 17). Compiled for the Association of Research Libraries, ed. by Arnold H. Trotier and Marian Harman. New York, Wilson, 1950. 235 p.

FOREST PRODUCTS

BROWN, NELSON COURTLANDT. Forest products; the harvesting, processing, and marketing of materials other than lumber, including the principal derivatives, extractives, and incidental products in the United States and Canada. New York, Wiley [c1950] 399 p.

PAPER MAKING AND TRADE—HISTORY

[FELDMÜHLE PAPIER- und ZELLSTOFFWERKE AKTIENGESELLSCHAFT] Paper tells; the story of a paper-mill near the Teutoburg Forest. To the hundred and fiftieth anniversary of the Feldmühle Works Hillegossen, Westphalia, Germany, 1799-1949. [Hillegossen, The Company, 1949] 93 p.

PAPER WORK

LOWRIE, DRUCELLA. The art of wrapping gifts. New York and London, Studio Publications, Inc., in association with Thomas Y. Crowell Co. [c1950] 96 p.

PETROLEUM

STANDARD OIL COMPANY OF NEW JERSEY, and affiliated companies. Technical publications, 1948. Arman E. Becker, editor. [n.p., The Company, c1950] 512 p.

PLASTIC MATERIALS

BRITISH PLASTICS year book, 1950; a classified guide to the plastics industry. London, Iliffe & Sons Ltd., 1950. 531 p.

RESEARCH LABORATORIES

NATIONAL RESEARCH COUNCIL. Industrial research laboratories of the United States, including consulting research laboratories. 9th ed., 1950, comp. by Myron J. Rand, with the assistance of Winnie Francis Yount, Roy F. Newkirk, and Emmit E. Noland. Bulletin of the National Research Council number 120. Washington, The Council, 1950. 444 p.

WOOD WASTE

NORTHEASTERN WOOD UTILIZATION COUNCIL. Chipped wood, production and uses. Bulletin no. 33. New Haven, The Council, 1951. 135 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ALKALINE PROCESSES

TAYLOR, L. B. Application of hydrogen sulphide in sulphidity control. Tappi 34, no. 1 : 12-15 (January, 1951).

Under proper conditions sulfur will react with caustic soda, soda ash, or lime to form hydrogen sulfide and sodium thiosulfate. Under similar conditions sulfur will react with lime to form hydrogen sulfide and calcium monosulfite. The hydrogen sulfide in each case is evolved as a gas and can be absorbed in kraft white liquor to adjust the sulfidity upward. The by-product thiosulfate may be added directly to the white liquor, or it may be added to the black liquor going to the furnace. The by-product calcium monosulfite may be reacted with the soda ash in the green liquor to form sodium monosulfite, which can be added to the white liquor. 2 tables, 1 figure, and 2 references. E.S.

ALKALINE PROCESSES—ODOR TROUBLE

HISEY, W. O. Abatement of sulphate pulp mill odor and effluent nuisances. Tappi 34, no. 1 : 1-6 (January, 1951).

The recovery system recently completed and put into operation at the mill of the South African Pulp and Paper Industries, Ltd., is described. This recovery plant was designed and installed with the intention of minimizing the odor and effluent nuisances which are commonly associated with sulfate pulp mill operation. Black liquor oxidation is included in the recovery operation, and the oxidation tower is used as a "sulfur trap," in that all waste gases containing malodorous sulfur compounds are diluted with air, passed through the black liquor oxidation tower, and residual gases from this tower are burned in the recovery furnace. In this way a large proportion of the malodorous sulfur compounds which are normally discharged to the atmosphere are destroyed, and their sulfur content is retained in the recovery cycle. Contaminated condensates from the digesters and evaporators are blown with air in a packed tower, and the effluent is used as make-up water in a spray-cooling pond. The odor nuisance from this effluent is negligible, and the quantity is less than 2000 gallons per ton of pulp produced. Even this small quantity may be reduced or entirely eliminated since the purity is such that it could be re-used in the causticizing system, or in pulp washing. Current operating practice is to re-use part of it in the causticizing system. A cyclonic evaporator and a set of fume-recovery towers have been installed following the soda-recovery furnace. Experience to date has indicated that a recovery of more than 90% of the sulfur compounds in the gases leaving the furnace is obtainable in this system. The odor level of the stack gases is very low and is reduced still further by the introduction of a small amount of chlorine. A slight, but distinct "kraft" odor is still evident in the stack gases, although the nuisance so created is hardly more than would result from a boiler plant of the same steaming capacity burning a high-sulfur-content coal. The measures undertaken to eliminate sulfur compounds from the liquor and gaseous effluents have resulted in a high degree of retention of sulfur in the

system, with consequent maintenance of sulfidity with relatively low additions of make-up chemical. 5 tables, 1 figure, and 8 references. E.S.

ASSOCIATIONS

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section.* Joint meeting of Technical Section Council with branch and committee chairmen. Pulp Paper Mag. Can. 51, no. 13: 80-7 (December, 1950); *cf.* B.I.P.C. 20: 304.

Summaries are given of the reports of the chairmen of the various branches and committees of the Technical Section of the Canadian Pulp and Paper Association, which were presented at a joint meeting with the executive council in Montreal on Oct. 25, 1950. The purpose of this meeting is the provision of all chairmen with an over-all picture of the activities of the section, giving them an opportunity for exchanging ideas, obtaining suggestions, and avoiding overlapping of effort. E.S.

RIDDELL, G. L. The Printing, Packaging and Allied Trades Research Association. Paper Making and Paper Selling 69, no. 3: 32-6 (Autumn, 1950).

The activities of the Association are discussed under the three headings: information, advisory service, and research. 4 figures and 7 references. E.S.

BAGASSE

BHARGAVA, M. P., KASBEKAR, G. S., and BHARGAVA, R. P. Utilisation of bagasse for wrapping and bag-paper manufacture. Cellulose and Paper (New Series), Indian Forest Bull. no. 148, 1949. Dehra Dun, The Forest Research Institute, 1950. 20 p. + 2 samples.

Bagasse is at present consumed as a boiler fuel in Indian sugar mills. The authors point out that it would be worthwhile to use a more efficient fuel and release the bagasse for kraft-paper manufacture. The results of laboratory and pilot-plant tests on bagasse as a source of paper are given in tabular form, and the details of digestion of bagasse for kraft wrapping paper are stated. Bagasse pulp in admixture with other long-fibered pulps, with or without a bonding medium such as tamarind-seed pectin, yields suitable paper for multiwall bags, at present urgently needed as a substitute for jute bags in India. With bagasse as the principal raw material, strong wrapping papers can be produced economically. 7 tables and 3 references. M.W.

BARKERS AND BARKING

ANON. Barkers in woods in South; hydraulic and portable mechanical types. Pulp & Paper 25, no. 1: 78, 80, 82 (January, 1951).

Brief reference is made to two Allis-Chalmers Streambarkers operating in the South and to a jeep-mounted, portable woods barker which follows the pulpwood saw. A load of green, freshly cut longleaf pine can be 95-100% debarked in 40 minutes. A crew of four was able to deliver 16 cords of peeled wood per day to the mill 29 miles distant; working from stacked pulpwood, four to five cords can be handled per hour, depending upon the wood. The barker uses about one gallon of gasoline per hour. 6 illustrations. E.S.

THE SANDY HILL IRON & BRASS WORKS. Sandy Hill Peppy Peeler. Paper Mill News 74, no. 3: 60 (Jan. 20, 1951).

This portable peeler is suitable for mounting on skids or low-slung truck wheels, for operation on its own base, or for stationary mounting. Its capacity will vary from two cords upward per hour, and it can be used for either softwood or hardwood at any season of the year. It can be supplied with a standard 24-h.p. engine, and it is equipped with a blower for removing the bark from the immediate vicinity of the machine. The peeler will handle logs 3-20 inches in diameter; wood in 4-, 8-, and 12-foot lengths will run through the machine at approximately the same speed. A team of three men is commonly used for the operation. Mention is made of tests which are being conducted to determine bark and fiber losses. 2 illustrations. M.W.

BEATING

STEPHANSEN, E. The beating of pulp at different temperatures. Svensk Papperstidn. 53, no. 24: 811-20 (Dec. 31, 1950). [In Norwegian]

Following a brief reference to two articles dealing with the favorable effect of beating at low temperatures (*cf.* Noll, B.I.P.C. 18: 653; Isatis, 19: 754-5), the author discusses certain studies on this subject at the Papirindustriens Forskningsinstitutt, although these have not yet led to a definite conclusion. Generally speaking, a higher degree S.-R. is obtained with the identical amount of beating at lower than at higher temperatures; however, this does not offer any real advantage to the papermaker. On the contrary, it seems that by beating at low temperatures, dewatering on the Fourdrinier wire is retarded, which is exactly the opposite of the result which the papermaker desires. Beating experiments in a Valley beater with different types of pulp are described, in which the lowest temperature was 4°C., the highest 70°, and the mean 40°. The results varied considerably with the type of pulp studied, and pulps from the same source did not always give the same data on subsequent trials made at intervals of several days or weeks. However, a special greaseproof pulp showed the greatest dependence on temperature. Although other greaseproof pulps exhibited this dependence to a much lesser extent, it seems that under certain conditions, beating at low temperatures might offer advantages for this type of pulp. Other sulfite pulps behaved quite differently. The relationships between beating temperature and rate of dewatering and similar relationships with certain strength properties are shown in a number of curves. Breaking length was found to develop slower, the higher the temperature during beating; a maximum was reached much faster at the lower temperatures. However, beating at low temperatures will lower the temperature of the entire system, so that dewatering on the Fourdrinier wire is retarded. To compensate for this fact, a shorter beating cycle must be employed which, in turn, will again result in a paper with lower breaking length; hence not much is gained by cold beating. Bursting strength follows in general the tendencies of the breaking length. Tear in relationship to beating period gives the highest values at high temperatures; the greaseproof pulp is again principally affected under these conditions; when plotted against degrees S.-R., the pulp beaten at the lowest temperature will show the highest tear. In conclusion, a number of photomicrographs of pulps beaten at different temperatures are presented and discussed. 23 figures. E.S.

STRACHAN, JAMES. Hemicelluloses and the beating process. Paper-Maker (London) 120, no. 6: 415 (December, 1950); *cf.* B.I.P.C. 21: 81.

The author refutes some of Cottrall's theories on the beating of rags and wood pulps. E.S.

BLEACHING—SULFATE

ANON. New Canadian bleach plants. Pulp & Paper 25, no. 1: 90-1 (January, 1951).

Brief reference is made to the new 300-ton bleach plant for Cellate (fully bleached kraft pulp) of the Brown Co. at La Tuque, Que., and to the new MacMillan bleach plant at Harmac, near Nanaimo, Vancouver Island, which is nearing completion. This eight-stage Kamyr bleach plant is one of the first in North America to use chlorine dioxide in one of the additional stages in accordance with the Holst process which is in operation in the Swedish sulfate mill at Husum. 3 illustrations of the La Tuque plant. E.S.

BOARD

GUT, H. The number of cardboard sheets and the square-meter weight. Allg. Papier-Rundschau no. 23: 1121 (Dec. 7, 1950). [In German] *cf.* B.I.P.C. 20: 851.

Calculations are given to account for the difference between the actual number of sheets per square meter of board and the theoretical weight based on the calculation of g./sq. m. A method for checking the g./sq. m.-weight of a delivery in a nonstandard size is outlined. E.S.

MÜLLER, MARTIN. The drawing properties of handmade boards. Allg. Papier-Rundschau no. 23: 1122-5 (Dec. 7, 1950). [In German]

The drawing process of board in boxmaking has hitherto received little consideration in the literature. The author discusses the factors which exert an influence upon the drawing properties of the material, with particular reference to chemical preparations used in the place of the customary weak soap solutions with which the blanks are coated prior to the treatment in the heated drawing press. The following substitutes were tested: sulfonated fatty alcohols and stearin and mineral-oil emulsions (all alkaline types), and paraffin emulsions of an acid character. All substitutes were found to be satisfactory under ordinary drawing conditions; the paraffin emulsions are particularly adapted for use in containers for which a high degree of moisture resistance is desired. Other factors investigated included the raw materials and their chemical and mechanical treatment during manufacture, moisture conditions, and drawing temperatures. Boards for drawing purposes should not be highly calendered and compressed; slightly calendered material is most suitable. Probably the most important factor is the uniform moisture distribution (8-11%) throughout the board; after the application of the coating solution (soap or chemicals), the boards must be allowed to mature for a sufficiently long period; six hours is the minimum. In general, an application of at least 60 g./sq. m. to one side of the board is sufficient; applications to both sides do not offer any advantages. The drawing temperature should be within the range of 100-140°C. Data in tabular form are included. E.S.

BOARD—CONDITIONING

JANSSON, HANNES. Continuous heat treatment and humidification of hard fiber boards at Säynätsalo. Paper and Timber (Finland) 32, no. 12: 384-7 (December, 1950). [In Swedish; English summary]

The author describes the conditioning plant at the Finnish board mill in Säynätsalo; the treatment consists of a heating stage which lasts for three hours at 163°C., followed by a seven-hour humidifying stage at 40° and

95% R.H. The treatment improves the strength of the hardboards, which leave the conditioning plant with a moisture content of 6-8%. 2 figures. E.S.

BOARD, BINDER'S

KANTROWITZ, MORRIS S., and BLAYLOCK, FREDERICK R. Paper boards for bookbinding. GPO-Research and Engineering Council of the Graphic Arts Industry, Inc. Bindery series no. 9: 1-7 (1950).

Binders board and chestnut cover board are discussed under the following headings: definition, manufacture, research, specifications, and tests on deliveries. In an appendix, the use and methods of testing paperboards in the Government Printing Office are described. 2 tables and 1 reference. M.W.

BOARD MILLS

ANON. Century mark for Robertson. Fibre Containers 35, no. 12: 138, 140, 142 (December, 1950).

A history of the Robertson Paper Box Co., Inc., Montville, Conn., is given; the year 1950 marks a full century of the company. Starting as a paper mill, its growth parallels the development of the paperboard field as an outgrowth of the paper industry. Almost the entire mill production is converted into folding boxes for packing blankets, sheets, wearing apparel, footware, hardware, candy, cosmetics, toys, and facial tissues in folding cartons. 8 illustrations. E.S.

ANON. Improvements at North Charleston plant of Westvaco. Paper Trade J. 131, no. 25: 12 (Dec. 21, 1950); Southern Pulp Paper Manuf. 14, no. 1: 46 (January, 1951); Fibre Containers 36, no. 1: 62-3 (January, 1951); Paper Ind. 32, no. 10: 1061 (January, 1951).

Reference is made to the rehabilitation program of the board mill at North Charleston, S.C., of the West Virginia Pulp and Paper Co., which is not yet complete. At first the power plant was enlarged, two new recovery units were constructed, and an older unit was rebuilt. A new lime kiln and lime-mud washer were added. The revamping of one of the Fourdrinier board machines was preceded by the installation of a new stock-preparation system; the machine was equipped with a new Fourdrinier section with a wire 140 feet long, an improved press section, and additional drier capacity. Three larger calender driers replaced three older, smaller ones. The rebuilding added 24 feet to the over-all length of the machine, which now measures 397 feet from the headbox to the reel. Improvements in the pulp mill will include a continuous vacuum filter-washing system, one new digester, and a new screen room. E.S.

ANON. A new South African board mill. Paper-Maker (London) 120, no. 6: 414 (December, 1950); World's Paper Trade Rev. 134, no. 18: 1314 (Nov. 23, 1950).

A brief description is given of the small board mill of Trans-African Paper Products (Pty.), Ltd. at Boksborg in the Transvaal. The plant was installed by Celdecor Africa Ltd. and is of the conventional type; the raw material consists principally of locally collected waste paper, supplemented by a small amount of imported pulp. The two-vat board machine with streamlined inlet was supplied by Maule & Cie. of Turin, Italy. Advantage is taken of the low relative humidity of the atmosphere to dry without heat in the open air. A Sveen-Pedersen saveall built in the Union has been installed,

and the white-water system at the mill is practically closed. The mill produces about 100 tons of fiberboard per month, which is used in the manufacture of suitcases, shoes, motor-car bodies, and electrical equipment. Ample space is provided for the installation of a second board machine, the construction of which is anticipated in 1951. 2 illustrations in the first, and 1 in the second reference. E.S.

THE GARDNER BOARD AND CARTON COMPANY, *Middletown, Ohio.* Fifty years of progress at Gardner Board and Carton. Paper Ind. 32, no. 10: 1072-7 (January, 1951); *cf.* B.I.P.C. 21: 397.

Excerpts from its 50th anniversary volume "This is Gardner" are presented, including 16 illustrations. E.S.

PULP & PAPER. Green Bay uses aspen; another in semi-chem plant series. Pulp & Paper 25, no. 1: 50, 52, 57-8, 60, 101 (January, 1951); *cf.* B.I.P.C. 21: 80.

An illustrated description is given of the board mill of the Green Bay Pulp and Paper Co., Green Bay, Wis.; the sequence of the operations in the neutral semichemical pulping process, the flow in the board mill with one 174-inch Bagley and Sewall Fourdrinier machine, the equipment used, and the water and power systems are described; a brief mention is made of the personnel in the company and mills. 18 illustrations. E.S.

BOARD MILLS—DIRECTORIES

FIBRE CONTAINERS. Official board mill directory. Fibre Containers 35, no. 12: 74, 76, 78, 80-6, 88-99 (December, 1950); *cf.* B.I.P.C. 20: 385.

The annual directory of board mills in the United States and Canada is presented, including a regular listing, a specialty board mill section, and an alphabetical list of board mills. E.S.

BOARD SPECIALTIES

ANON. Plant tour. Packaging Parade 19, no. 216: 37-9 (January, 1951).

A description is given of the packaging process and the carton used by the Miller Brewing Co. in packing carry-out cartons of beer. The cut-out construction at the ends of the carton sides permits maximum display of the exposed metal cans which are kept in place by locking tabs in the top of the carton. 12 illustrations. M.W.

BRONZING

WOOD, G. H. H. Improved bronzing technique. World's Paper Trade Rev. 134, no. 19: 1353-4, 1359-60 (Nov. 30, 1950).

An illustrated description is given of the Soldan Bronzmaster, a British flat bronzing machine, for which many striking advantages over the cylinder-type machine are claimed. 5 figures. E.S.

BUYING

ANON. When it comes to paper. Am. Pressman 61, no. 2: 18, 20, 40, 54-5 (January, 1951); *cf.* B.I.P.C. 21:37.

Consideration is given to the questions concerned with the persons who order paper for a printing shop and decide what type of paper is to be used,

and the information upon which such a decision is based. Stress is laid on the necessity for constant checking and co-operation between those who make the paper, those who print it, and those who select it, in order to insure satisfactory and economical printing results. M.W.

CAUSTIC SODA

SKEEN, JOHN R. Caustic soda. Chem. Eng. 58, no. 1: 283-4, 286 (January, 1951).

This commodity survey presents a review of the processes for making caustic soda, and traces the growth of the industry. As a result of a production loss of about 10% and stimulated industrial demands, the present supply of caustic soda is poor. Developing plans for the national defense program anticipate progressive increases in requirements which will exceed the present capacity to supply, and it is therefore unlikely that the supply will increase until new production facilities materialize. Statistical data are included. 3 tables and 2 flow diagrams. M.W.

CELLULOSE—CRYSTALLINITY

NICKERSON, R. F. The relative crystallinity of celluloses. Advances in Carbohydrate Chem. 5: 103-26 (1950).

Some of the available information on relative crystallinity of celluloses is summarized, and some of its implications are indicated. There are large variations in the crystallinity estimate for similar cellulosic materials which may be attributed to the different methods of measuring, circumstances involved in the measurements, such as swelling, or the possibility that relative crystallinity is not a fixed quantity. Generally, estimates which depend on x-ray diffraction are higher than those obtained by chemical methods. Swelling may influence crystallinity either by the conversion of some crystallized cellulose to the amorphous form and/or by laying open the fiber to make accessible some noncrystalline areas which are inaccessible in the unswollen, dry material. The greater reactivity of the amorphous regions in cellulosic structure indicates that the modification of this small fraction (to render it resistant to hydrolytic, oxidative, and enzymatic attack) would impart a large measure of immunity to the fiber. In the case of regenerated cellulose fibers, these data can be used to minimize both swelling and strength losses. 9 tables, 3 figures, and 40 references. M.W.

CELLULOSE—DEGRADATION

FORZIATI, FLORENCE H., and ROWEN, JOHN W. Effect of changes in crystalline structure on the infrared absorption spectrum of cellulose. J. Research Natl. Bur. Standards 46, no. 1: 38-42 (January, 1951); *cf.* B.I.P.C. 21: 155-6.

The absorption spectra of native, mercerized, and amorphous celluloses are recorded for the region from 2 to 16 μ. Cellulose having the x-ray diffraction pattern of the native, or type I, crystal lattice is represented in this study by bacterial cellulose, cotton fibers, *Valonia* cell wall, and the residue from the hydrolysis of cotton linters. Cellulose having the x-ray diffraction pattern of the mercerized, or type II, crystal lattice is represented by regenerated cellulose, the residue from the methanolysis of mercerized cotton linters, and mercerized bacterial cellulose. Amorphous cellulose was obtained by milling the residue from the hydrolysis of cotton linters in a vibratory ball mill. The spectra of the type I cellulose showed sharper and more clearly defined absorption bands than the spectra of the type II celluloses. The most striking

differences were found in the 7- to 8- and 9- to 10-μ regions. In the former region of the spectrum of type I celluloses, definite absorption maxima of nearly equal intensity were found at approximately 7.0, 7.3, 7.4, and 7.5 μ. In the spectrum of type II celluloses, the maximum at 7.4 μ was lacking, whereas the absorption at 7.3 μ was considerably more intense than that at 7.0 and 7.5 μ. Observations in the 7- to 8-μ region of the spectrum of the amorphous cellulose were prevented by the use of a suspending medium that absorbed in that region. In the 9- to 10-μ region, definite absorption maxima were found at approximately 9.0, 9.4, and 9.6 μ with the type I celluloses. When cellulose I was converted into cellulose II or amorphous cellulose, these maxima merged into a single broad band. The conversion of cellulose I into cellulose II or amorphous cellulose also resulted in an increase in the intensity of the absorption at 11.2 μ. Although factors other than a decrease in type I crystallinity may contribute to these changes in absorption characteristics, the changes may prove useful in evaluating changes in the crystalline structure of cellulose. 1 table, 2 figures, and 23 references. E.S.

CELLULOSE—DERIVATIVES

BRESLOW, DAVID S. The synthesis of acid-soluble derivatives of cellulose. J. Am. Chem. Soc. 72, no. 9: 4244-6 (September, 1950).

Derivatives of cellulose which are soluble in dilute acids have been prepared by the reaction of nicotinyl azide or *p*-dimethylaminophenyl isocyanate with cellulose derivatives. The compounds prepared were ethylcellulose β-pyridylcarbamate, cellulose acetate β-pyridylcarbamate, and hydroxyethylcellulose *p*-dimethylaminophenylcarbamate. 1 table, 1 figure, and 14 references. E.S.

CELLULOSE—HEAT OF CRYSTALLIZATION

CALVET, E., and HERMANS, P. H. Heat of crystallization of cellulose. J. Polymer Sci. 6, no. 1: 33-8 (January, 1951).

The authors found that from measurements of the heats of solutions of cellulose of different degrees of crystallization, the heat of crystallization of cellulose could be determined; the value is 4100 cal./mole. This figure is about 25% less than the heat of crystallization of β-glucose and is very close to that which Hermans found by means of the heats of wetting (*cf.* Contributions to the physics of cellulose fibres. New York, Elsevier, 1946). The knowledge of the heat of crystallization of cellulose and the determination of the heats of solutions make possible the determination of the percentage of crystallization in a sample when the composition of this sample is known. 2 figures and 32 references. E.S.

CELLULOSE—HEAT OF WETTING

WAHBA, MAURICE, and NASHED, SHAWKY. Change with temperature of the heat of wetting of dry cellulose in water, and its bearing on the specific heat of the adsorbed water and of the swollen cellulose. Nature 166, no. 4232: 998 (Dec. 9, 1950); *cf.* B.I.P.C. 21: 232.

The heat of wetting of dry standard cellulose in water was found to decrease at the rate of 0.042 cal./°C./g. of cellulose with a rise in temperature between 0° and 40°C. The heat of wetting represents the decrease in heat content of the system, and therefore the measured decrease in the heat of wetting indicates that the heat capacity of the system is greater after wetting

than before, in accordance with Kirchhoff's equation: $d(\Delta H)/dT = \Delta C_p$. This is considered to be a result of the depolymerization of the water, because it has been found that the specific heat of water increases upon depolymerization. An increase of pressure causes a decrease in the specific heat of water at constant temperature, and it is assumed that an increase of pressure would cause an increase in the D.P. Since the specific heat increases with a rise of temperature, which would decrease the D.P., it is concluded that the adsorbed water has a higher specific heat than that of ordinary water because of a smaller D.P. The cellulose would also have a higher specific heat, because the swelling process is analogous to depolymerization. 1 table and 2 references. M.W.

CELLULOSE ETHERS

PEHRSON, STIG O. Preservation of sodium carboxymethylcellulose from microbiological degradation. Svensk Papperstidn. 53, no. 22: 726-32 (Nov. 30, 1950). [In English; German and Swedish summaries]

The viscosity of heat-sterilized solutions of sodium carboxymethylcellulose (I) for a prolonged storage time under aseptic conditions normally does not decrease, whereas unsterilized (I) may show a rapid loss in viscosity, accompanied by a variety of undesirable changes, such as turbidity, deposits, discoloration, obnoxious odor (hydrogen sulfide), and agglomerations of mycelium. All these phenomena are caused by micro-organisms (molds or bacteria) which are able to utilize (I) as a carbon source. (I) solutions prepared in water which does not contain the necessary mineral salts required for growth are sometimes resistant to microbiological attack or are only slowly degraded, despite the fact that they are contaminated with a great number of organisms capable of causing a breakdown. In the presence of the necessary mineral salts, however, such resistant (I) solutions are rapidly liquefied. For preserving (I) solutions, it is therefore necessary to add a disinfectant; the effects of some commercial preparations have been studied. Phenylmercuric acetate (1-10 mg./liter), sodium pentachlorophenate (100-200 mg./liter), and the sodium salt of dihydroxydichlorodiphenylmethane (100 mg./liter) have been found effective and are recommended for technical purposes. Bacteria seem to be more resistant than molds and require the higher concentrations. The disinfectant must be homogeneously dispersed in the solution to secure good results. It is therefore advisable to add it to the water used for the preparation. Elementary hygienic precautions should be taken in handling the concentrated preparations of the mercurials and chlorophenols. 10 tables and 2 references. E.S.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

BRYDE, Ø., and SMITH, T. H. Nitration as an analytical tool in the study of woods pulps. III. Nitration of semichemical pulps. Norsk Skogind. 4, no. 11: 308-12 (November, 1950). [In English; Norwegian summary] *cf.* B.I.P.C. 20: 165-6.

The fractionation procedure and some applications of the method to the sulfite process and the initial stages of semichemical processes are described. When slightly disintegrated pulps are investigated, an acetone-insoluble fraction is found in some of the nitrated samples, which indicates a linkage between lignin and cellulose, which is subsequently broken during the early stages of the cook. Measurements of the change in viscosity of the acetone-soluble component give information of the chain length of the cellulose in the cellulose-lignin complex. A close relationship between the amount of acetone-

insoluble material and the strength properties of the semichemical pulps has been established. The ideal semichemical process would involve the splitting of the lignin-cellulose complex with a minimum reduction in yield (or removal of substance). 8 figures and 13 references. E.S.

EMERY, CONSTANCE, and COHEN, W. E. Molecular-weight distribution studies on various nitrated celluloses. Australia. Commonwealth Scientific and Industrial Research Organization. *Division of Forest Products.* Project C.5. Sub-Project C.5-5, Progress Report 7. 41 p. + 12 plates (July, 1950).

Chain-length distribution curves for a number of fractionated cellulose nitrates were prepared. Previous evidence for the occurrence in the cellulose chain of a periodic acid-sensitive link was not confirmed. A criticism was made of the suitability of the methods now used for determining molecular-weight distributions of very high polymers, and it was pointed out that the degradation of nitrocellulose in acetone solution has been overlooked by almost every worker in the field. Because of this fact, the authors express their doubt that any significant distribution pictures for nitrated cellulose of very high molecular weight can be obtained from fractionation by either the precipitation or solution methods. 10 tables, 23 figures, and 22 references. M.W.

CHEMICALS

CHEMICAL ENGINEERING. Carbon bisulphide. Chem. Eng. 58, no. 1: 174-7 (January, 1951).

A pictured flowsheet of the Taylor process for manufacturing carbon disulfide is presented, as operated by the J. T. Baker Chemical Co. at Penn Yan, New York. Carbon disulfide is a widely used industrial chemical; the major portion of the entire output is required in the manufacture of rayon. Cellophane and dyestuffs also consume sizable quantities. 1 table, 1 graph, 1 flowsheet, and 9 illustrations. E.S.

STILBERT, E. K. Recent developments for the paper industry by Dow Chemical Co. Paper Trade J. 132, no. 2: 28, 30 (Jan. 12, 1951).

A discussion is presented of some of the most recent material and use developments for the paper industry by The Dow Chemical Co. In the field of beater sizing, Methocel CAM is mentioned, and the use of Methocel HG in size-press work is described. Mention is made of Dow Latex 512-K as a size-press coating adhesive. Dow has produced products in the converting field for use as antimicrobial coatings. Dehydroacetic acid and its sodium salt are new products in this field, and orthophenylphenol (Dowicide 1) and its sodium salt (Dowicide A) have been improved. An improved vinylidene chloride-acrylonitrile copolymer latex, Saran Latex F122-A20, has been returned to the market, and Dow Latex 744, a vinyl chloride-vinylidene chloride copolymer, has recently been introduced. Other typical Dow products which can be used as plasticizers are Rhoplex FRN, Hycar OR25, Neoprene 571 or 842A, and Dow Latex 512K. An improvement in Ethocel is reported by which it is emulsified without the use of volatile solvents for dispersion. 3 references. M.W.

CHIPS

MURTO, JAAKKO O. Chipping of pulpwood. IV. Defects of pulpwood chips. Norsk Skogind. 4, no. 11: 322-30 (November, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 310-11; 21: 234.

Certain pulpwood defects (defective shape and structure, chemical and mechanical defects, fungus attack, and foreign impurities) affect the chipping results adversely, and only a portion of such defective chips can be removed by the chip screens. The decisive dimension in chip screening is the breadth of the chip which, however, is of secondary importance in cooking, including sulfite pulp, where the length of the chip plays the most important part. The thickness of mill chips is approximately 15-20% of their length; however, chips containing knots are abnormally thick. The shearing action of the chipper knives in cutting results in about twice as many fiber fragments in hardwood as in softwood pulps; this is caused by the difference in fiber length. The extent of the damage to the one end of the chip can be determined in slow laboratory chipping by calculating the percentage of the wood tissue displayed by the chipper knife, as compared with the volume of the whole chip. This damage to chips (which severely affects the papermaking properties of sulfite pulps) may also shorten the length of the chip, so that in some cases it may even be an advantage. On the other hand, the damaged end of the chip produces the finer fibers, the softer the sulfite cook. The amount of chipping fines produced depends principally on the sharpness of the knives and also on wood quality. In addition, it has been established that a vigorous disintegration of chips and pneumatic conveying (frequently used by Scandinavian mills) result in the splitting of short and thin chips into narrow, needlelike ones. When the percentage of these chips becomes considerable, sulfite pulp prepared from such chips is no longer suitable for the manufacture of strong papers. In single-knife, wide-spouted chippers, three to four times more chipping fines and small chips are produced from frozen than from unfrozen pulpwood. Most chips prepared from knots appear in the oversize fraction and could be cooked separately for an inferior grade of pulp. Bark particles adhere to the surface of the chips and are not separated by screening. The unfavorable effect of too short or misshapen logs, or those of a too small diameter, on chipping is well known. Rotten wood which has been seriously attacked results in fine splinters and small chips and contributes to a substantial percentage of the undersize fraction in screening. In conclusion, the author discusses the aspects of chip classification by screening and the importance of chip analysis in sulfate and sulfite pulping studies. 4 tables and 7 figures. E.S.

NORTHEASTERN WOOD UTILIZATION COUNCIL. Chipped wood; production and uses. Northeastern Wood Utilization Council, Bull. no. 33: 7-134 (January, 1951).

The development of portable wood chippers led to an investigation of means of utilizing wood chips. This was the subject of a conference held by the Council in co-operation with the Soil Conservation Service and the Pulp and Paper Research Institute of Canada. The papers and a summary of the discussions are presented in this bulletin. Indications are that chips can be used successfully as a means of returning organic matter to the soil, as a mulch for berry plants, and as a bedding material for cattle. The possibilities of using chips in the manufacture of roofing felts, wallboard, and as fuel are also considered. The papers included in the bulletin are listed here by author and title: McIntyre, A. C. Wood chips and farming—27 references, p. 7-13; Koroleff, A. Possibilities of wood chipping in forest management, p. 15-18; Morgan, James T. Stationary chippers for processing low-quality and waste wood—7 references, p. 19-26; Fobes, E. W. Portable wood-chipping equipment, p. 27-40; Fenton, R. H. A pilot study of the use of light portable wood chippers, p. 41-7; McKusick, H. A. Land clearing, p. 49-51; discussion, p. 52-4; Miller, Ira M. Power lines, p. 55-8; Silversides, C. R. Pulpwood operations, p. 59-63; Shutak, V. G., and Christopher, E. P. Mulch for berries—7 references, p. 65-78; discussion, p. 78-9; Salomon,

Milton. Decomposition of wood chips in soil, p. 81-2; Lunt, Herbert A. Wood chips as a soil amendment, p. 83-8; discussion, p. 89; Schon, R. C. Material for compost, p. 91-4; discussion, p. 94; Henderson, Bancroft W., Jr. Wood chips as a bedding material for dairy cows, p. 95-6; Pulver, William. Wood chips as bedding, p. 97-8; discussion, p. 99-100; Hart, J. S. Pulpwood—13 references, p. 101-3; discussion, p. 103-5; Lockard, C. R., and Hrubesky, C. E. The saturating felt industry in the Northeast as a market for wood chips, p. 107-16; Ratliff, Francis T. Wood chips for use in roofing felt manufacture, p. 117-18; discussion, p. 118-19; Aries, Robert S. Wallboard, p. 120; Miller, E. C. Fuel, p. 121-4; discussion, p. 124-6; Anon. List of chipper manufacturers, p. 127-8; Grainger, E. E. Operation of chipper at Sturgeon Falls, Ontario, 129-32; and Webber, R. A. Test on wood chips for pulp, p. 133-4. Tabulated data, diagrams, and illustrations are included in many of the articles. M.W.

CHLORINATION PROCESS

CELLULOSE DEVELOPMENT CORPORATION, LTD. Straw and bagasse for paper making. Paper-Maker (London) 120, Annual no.: 36, 38 (1950).

Brief reference is made to new mills under construction in different parts of the world which will utilize the Celdecor-Pomilio process for straw, bagasse, hardwoods, and waste paper. 2 illustrations. E.S.

CHLORINE

AMROC INCORPORATED, *New York*. Small industry can economize by making own chlorine and caustic electrolytically. Chem. Processing 14, no. 1: 54 (January, 1951).

A compact unit for producing at least 225 pounds of 100% caustic, 200 pounds of chlorine, and 5 pounds of hydrogen in 24 hours is described. The plant operates with a highly developed mercury cell with a rating of 3000 to 3500 amperes. 1 illustration. E.S.

CHEMICAL AND ENGINEERING NEWS. Chlorine. Chem. Eng. News 29, no. 5: 364-9 (Jan. 29, 1951).

A staff report on the present status of chlorine production is presented. The methods of production, the world's producers, industrial mobilization, and government aids are discussed. 1 table, 3 diagrams, and 2 illustrations. M.W.

CHROMATOGRAPHY

STRAIN, HAROLD H. Chromatographic systems. Anal. Chem. 23, no. 1: 25-38 (January, 1951); *cf.* B.I.P.C. 20: 391.

The author presents a review of the numerous new developments during 1950 (including a few references to 1949) in the technique and application of chromatography. 4 tables, 12 figures, and 420 references. M.W.

COLORIMETRY

GILES, C. H. Absorptiometric colorimetry. J. Soc. Dyers Colourists 66, no. 12: 615-29 (December, 1950).

This review is an attempt to give a short account of the basic principles of the operation and construction of absorptiometric colorimeters and of their historical development, and to offer a guide to the wider literature on the subject. Descriptions are given of the Beer-Lambert laws, photoelectric

cells and absorptiometric colorimeters incorporating them, the various types of visual comparison instruments, apparatus for making continuous measurements, the reasons for the use of color filters and their correct selection, the determination of colored substances in mixed solution, the accuracy of absorptiometric colorimeters, desirable future developments, and terminology. 16 figures and 85 references. E.S.

KING, CHARLES F. Color control by instrument? Inland Printer 126, no. 3: 45-8 (December, 1950).

The General Electric recording spectrophotometer is described; the instrument measures the reflecting ability of colored substances and records the measurement on a graph. It provides an excellent means of standardizing color, but its use in duplicating colors and inks as a production control instrument is limited, because of the many variables which must be taken into account. The difficulties encountered in reproducing curves are discussed. The limitations of the Photovolt Model 610 for color control in printing shops are also considered (*cf.* B.I.P.C. 21: 184). 1 figure. M.W.

CORROSION

FLYNN, FRANCIS W. First published kraft industry report. Digester corrosion. Pulp & Paper 25, no. 1: 34-5 (January, 1951).

Brief reference is made to the formation of the Digester Corrosion Subcommittee of the TAPPI Chemical Engineering Committee and the establishment of a program to obtain further data which might be correlated. The plan included questionnaires to kraft mills, checking with Canadian and European associations, discussions with fabricators, literature surveys, the use of nonmetallic linings, and cathodic protection. The progress of these activities to date is reviewed, including a report on a Canadian meeting and a committee meeting at the annual National Engineering TAPPI Conference in Cincinnati. E.S.

KNAPP, G. W. The protection of electric equipment from corrosion in pulp and paper mills. Paper Trade J. 132, no. 3: 18, 20, 22, 24, 26 (Jan. 19, 1951).

Various methods of preventing corrosion of electric equipment in pulp and paper mills are described. In most cases standard equipment can be used, but where corrosive conditions are bad, it is recommended that motors be suitably enclosed. 10 figures. M.W.

MALOY, R. H. Protective coatings prevent pulp mill corrosion. Paper Trade J. 131, no. 25: 18, 20-1 (Dec. 21, 1950).

The development, qualities, and uses of the coatings manufactured by the Insul-Mastic Corp. of America are discussed, which are prepared from gilsonite (a pure bitumen found in Utah), flake mica, asbestos, and clay. An indication is given of the many places and conditions in pulp and paper mills where the proper coating can prevent corrosion from fumes, vapors, liquids, weather, and condensation. E.S.

TANZOLA, WILLIAM A. Control of condensate return line corrosion. Tappi 34, no. 1: 25-9 (January, 1951).

The perplexing problem of condensate-return line corrosion is discussed from the standpoint of the basic factors that are involved and the mechanism of the corrosion reactions. The sources of the corrosive gases, oxygen and carbon dioxide, are outlined, and methods of removal of dissolved oxygen

and reduction of carbon dioxide are presented, from the standpoint of both the mechanical changes that can be made to the condensate system and the external water treatment methods of the water that are possible. The complete elimination of carbon dioxide from condensate systems is not possible, and even small concentrations of this gas in solution can produce undesirable amounts of corrosion. The use of neutralizing types of amines for the control of carbon dioxide corrosion is cited. The introduction of a new approach to the control of condensate corrosion through the use of filming-type amines is discussed. 4 tables and 5 figures. E.S.

DIGESTERS

THOMAS, BEAUMONT. Factors influencing the service life of brick linings in sulphite digesters. Tappi 34, no. 1: 16-20 (January, 1951).

To maintain a balance between tensile and compressive stresses in a brick digester lining so that a tight seal between lining and shell is always maintained, it is necessary to consider the "residual" compression which normally builds up in a lining. The residual stress develops relatively slowly to a point of approximate constancy and depends upon the water swelling and elasticity of the materials. The combined stress caused by water swelling and thermal expansion should at all times be sufficiently great to exceed all influences tending to cause tension, but should not be so great as to exceed the strength of the lining or lining materials. Actual temperature measurements taken at numerous points in a digester lining and shell show the variations in the temperature gradients throughout the cooking cycle and under varying conditions. The results of this work emphasize the need for consideration of such factors as external temperatures, cold air drafts, installation temperatures, sudden heating or cooling of the face of the lining, and other influences which frequently might not be considered important by themselves. Whereas the lining materials are chosen and the lining designed so that sufficient safety is incorporated to compensate for some irregularities, nevertheless an accumulation of irregularities, all acting to increase the effects in one direction, may reduce the service life of a lining or cause excessive maintenance. On the other hand, general recognition of these less obvious factors should aid in extending the average life of digester linings even beyond the present-day average. 6 figures and 8 references. E.S.

DRYING

FRIEDMAN, SAMUEL J. Drying. Ind. Eng. Chem. 43, no. 1: 70-5 (January, 1951); *cf.* B.I.P.C. 20: 393.

A section on the drying of paper is included in this review of the year's literature in the field of drying. 1 illustration and 185 references. M.W.

DYES AND DYEING

ANON. Optical bleaching; Blankophors for the manufacture of very white papers. Allg. Papier-Rundschau no. 24: 1172 (Dec. 30, 1950). [In German]

Fluorescent brightening agents, which have been successfully applied in the paper and textile industries, are substantive dyestuffs which are readily absorbed by cellulose without the aid of fixing agents; however, they are not suitable for papers containing a large amount of groundwood pulp. The different grades of Blankophors (R, B, and G), their special brightening effect when used alone or in combinations, and their application (generally in the beater) are described; they can also be used with pastel colors but

not with intensively colored dyestuffs. Blankophors have a characteristic fluorescence under the quartz lamp, and their presence in papers can be readily detected. E.S.

EVAPORATION AND EVAPORATORS

BADGER, W. L., and LINDSAY, R. A. Evaporation. Ind. Eng. Chem. 43, no. 1: 75-8 (January, 1951); *cf.* B.I.P.C. 20: 394.

The trends and advances in the theory of evaporation and the design and operation of evaporators as they appeared in the literature of 1950 are summarized. 1 illustration and 48 references. M.W.

KOHLINS, W. D., and DEMAREST, E. L. Waste utilization and disposal systems. Chem. Eng. Progress 46, no. 12: 597-600 (December, 1950).

The use of chemical engineering unit operations in the handling of waste problems is discussed. Cost studies of evaporation and drying on several different types of waste disposal problems which have been successfully solved are presented. The five specific waste problems considered are: fermentation waste liquors, liquor from rag-cooking operations, fishing industry applications, metal-treating plants, and whey. 6 tables and 4 figures. M.W.

FIBER—ANALYSIS

MATLIN, NATHANIEL A. Spot test analysis of the ash of natural cellulosic fibers. Am. Dyestuff Reptr. 40, no. 2: 44-8 (Jan. 22, 1951).

A system of spot tests has been developed for application to the ash of native cellulose fibers. Each test is described, and a short discussion of the chemistry involved is given. Specific tests for borates, chromates, phosphates, sulfates, iron, tin, antimony, copper, zinc, aluminum, magnesium, calcium, and silica and silicates are included. Experimental data are listed and discussed. 4 tables, 3 figures, and 3 references. M.W.

PRESTON, J. M., and NIMKAR, M. V. The use of density gradient tubes in fibre studies and their application to the analysis of fibre mixtures. J. Textile Inst. 41, no. 11: T446-54 (November, 1950).

A new method is described for the quantitative analysis of binary mixtures of fibers by measurements which can be made conveniently in the density gradient tube. The procedure is based on the Linderstrøm-Lang method for following dilatometric changes in drops of protein solutions. The method depends on setting up a vertical diffusion gradient between two organic liquids with densities above and below the density to be measured. When the fiber is introduced into the mixture, it sinks to a level of density equal to itself. Fixed points of density in the gradient are obtained with small glass floats of known apparent density, and a comparison can be made. The testing apparatus is described in detail, and the use of this method for the identification of fibers and the quantitative analysis of fiber mixtures is considered. 3 tables, 6 figures, and 6 references. M.W.

FIBER—STRUCTURE

HODGE, A. J., and WARDROP, A. B. An electron microscopic investigation of the cell wall organization of conifer tracheids and conifer cambium. Australian J. Sci. Research B 3, no. 3: 265-9 + 10 plates (August, 1950).

An electron micrograph of a replica of the inner surface of the secondary cell wall of a conifer tracheid, demonstrating the almost transverse orientation of the microfibrils in this layer, is presented. This evidence provides confirmation of the type of cell-wall organization of conifer tracheids proposed in other investigations on the basis of x-ray and optical evidence and of microscopic examination. The existence of fibrils of 50-100 A. in diameter has been demonstrated in cell-wall fragments obtained by the disintegration of cambium initials and conifer tracheids. It is suggested that these microfibrils may correspond to the "micelles" or "crystalline regions" inferred from x-ray examination. 10 plates and 25 references. E.S.

JAYME, GEORG, and KÖPPEN, ANDREAS VON. Structural and chemical differences between sulfite and sulfate pulps. Das Papier 4, no. 19/20: 373-8; no. 21/22: 415-20; no. 23/24: 455-62 (October-December, 1950). [In German]

Previous literature is reviewed in which the different behavior of sulfate (I) and sulfite (II) pulps during mechanical and chemical conversion is discussed; in most cases indications of certain phenomena were given, but there were no satisfactory explanations for their occurrence. (I) differ from (II) in the following properties: their fibers are more flexible, yield less transparent sheets, are considerably more resistant to beating, develop higher sheet strengths (folding endurance and tear-through in particular, which must be traced to a lesser shortening of the fibers during the mechanical beating process), and a higher average strength, even at lower D.P.'s. Papers prepared from these pulps are considerably more resistant to heat and suffer a lower loss in strength during conversion to paper yarns. In addition, they possess a lower resin content and acidity (hence, a lower ion-binding capacity), different affinity for basic dyestuffs, and a higher furfural value, but a lower percentage of readily soluble hemicelluloses. They require less rosin for sizing and, after swelling, lack microscopically visible cross and longitudinal fissures. Their swelling value in water is lower, as is their reactivity to alkaline-oxidative degradation and xanthation. The aim of the present investigation was the detection of the causes for these differences. For this purpose, unbleached (I) and (II) were prepared in the laboratory from the same raw material (sprucewood chips); data on these pulps are given in tabular form. By varying the cooking period, one (I) and one (II) with almost identical lignin contents (3.58 and 3.60%) were obtained which play a significant part in the following studies. The pulp samples were dissolved by emulsion xanthation according to the method of Jayme and Wellm (*cf.* B.I.P.C. 15: 401-2). Typical variations in the viscosity of the two pulps during the process of dissolution resulted. In (I) and (II) with the identical lignin content, a much more rapid dissolution took place in the former and with a lower final D.P.; hence, a much more pronounced inhibition of the process in (II) through the lignin became evident. The swelling value of (I) in water was also lower, indicating the presence of lesser quantities of high-swelling hemicelluloses. This difference persisted on delignification with increasing amounts of sodium chlorite; both pulps showed first an increase, then a gradual decrease of swelling. A swelling maximum was obtained with 15% of sodium chlorite for (I), and with 4-8% for (II). The well-known bleaching difficulties of (I) may probably be traced not only to the lower reactivity of the thiolignin, but also to its lesser accessibility (in a topochemical sense) than that of the lignin in (II). With increasing delignification a distinct change of the xanthate D.P. values took place, characterized by an initial steep decrease, followed by an equally steep increase and a subsequent gradual decrease. The first decrease is explained by a rupture of lignin-polysaccharide linkages, the increase by the increasing solubility of

the lower lignin contents, and the second decrease by certain degradation phenomena. The first decrease in (I) is more pronounced, which may be caused by the presence of larger or more numerous lignin-polysaccharide complexes. Residues which are formed on partial xanthation increase with increasing delignification. The distribution of the lignin in solution and the residues differed in (I) and (II) to the extent that they were rather uniform in (I) (solution 3.1%, residue 4.7% lignin) and very irregular in (II) (solution 2.8%, residue 11.8%). It must be concluded that (II) contains in certain places locally higher lignin concentrations. This is confirmed by the structure of the lignin residues obtained on saccharification; those of (I) decompose to a practically amorphous mass, whereas those of (II) still show a distinct fibrous structure. The chemical investigation showed a higher true pentosan content, but a lower percentage of polyuronides for (I) than for (II); this explains the lower swellability and acidity of (I) which has a higher α-residue and a lower percentage of readily soluble hemicelluloses. The different distribution of lignin in (I) and (II) is illustrated graphically. The residual lignin in (I) is distributed rather uniformly over the entire surface of the cell wall, whereas in (II) it is concentrated in the outermost cell-wall layers. A similar distribution may be assumed for the hemicelluloses which, in addition, carry more carboxyl groups in (II). Therefore the surface of (I) contains less lignin and fewer low-swelling, high-polymeric hemicelluloses, which explains their lower tendency for fibrillation, higher beating resistance, and higher sheet strength. The fiber surface of (II) shows a higher content of lignin and low-polymeric, high-swelling hemicelluloses, which is the reason for the ready fibrillation of (II). The fibrils tear off easily and form mucilages, and the points of adhesion have a lower bonding strength, resulting in a generally lower sheet strength. In the chemical conversion of (I), a certain lack of reactivity caused by the lower swelling properties must be overcome. The more uniform chain-length distribution, on the other hand, should show definite advantages in the final product. The locally higher hemicellulose concentration in the outer cell walls of (II) impairs acetylation and results in higher residues than found for (I) with identical amounts of hemicellulose. The present studies explain the frequent failure of chemical analysis in indicating the differential behavior of two pulps with apparently very similar chemical data. They show that not only the amount and type of the substances which accompany the cellulose must be taken into account, but also their local distribution within the cell-wall layers; this distribution is capable of causing reactions which are far in excess of the influence exerted by the actual quantities in which they are present. 12 tables, 15 figures, and 35 references. E.S.

LANGE, PAUL W. The distribution of the components in the plant cell wall. Part I. Optical methods for micro analysis of the plant cell wall. Svensk Papperstidn. 53, no. 23: 749-66 (Dec. 15, 1950). [In English; German and Swedish summaries]

The author describes the theoretical fundamentals and experimental arrangements for microspectrographic and microradiographic methods as applied to quantitative studies of the components of the woody cell wall, notably the carbohydrates and lignin. The microspectrographic methods are discussed from the photographic and photoelectric aspect, including instruments used for the visible and ultraviolet range. Engström's microradiographic procedure [*cf.* Acta Radiol. Suppl. 63, 106 p. (1946); Biochem. et Biophys. Acta 4: 351-73 (1950)] with slight modifications was found suitable for determining the distribution of the total mass in the woody cell; the method and apparatus are outlined briefly. 11 tables, 26 figures, and 17 references. E.S.

FIBER—SURFACE PROPERTIES

MARK, HERMAN F. Fiber to fiber bonding. Southern Pulp Paper Manuf. 14, no. 1: 34; discussion: 34, 56 (January, 1951); Paper Trade J. 132, no. 1: 31, 39; discussion: 39 (Jan. 5, 1951); Tappi 34, no. 2: 79-81A (February, 1951). [Abridgment]

The theories of fiber-to-fiber bonding and the factors which enter into the adhesion of one fiber to another are described under mechanical (I) and polar attraction (II), hydrogen bonding (III), and true chemical bonding (IV). The importance of each bonding factor in the wet strength of paper is discussed. In paper, (I), (II), and some of (III) contribute to fiber bonding; hydrogen bonds are created principally through fibrillation of the paper pulps during refining. In most papers it is undesirable to have too many (IV) bonds because of the resultant stiffness and brittleness of the sheet. Rubber and resins can be used to give wet strength with the necessary stretch and elongation; groups are employed for this purpose which give hydrogen bonding with the hydroxyl groups of cellulose. 1 table. E.S.

FOAM

PATTLE, R. E. The control of foaming. I. The mode of action of chemical antifoams. J. Soc. Chem. Ind. (London) 69, no. 12: 363-8 (December, 1950).

A large number of substances were tested for their ability to destroy the foam on four different foaming aqueous solutions. The ability or inability of the antifoams to spread on the foaming liquid was also studied. It is concluded that antifoams act by displacing from the surface the substance causing the foaming (or, in salt solutions, preventing negative adsorption) by either dissolving in the foaming liquid or by spreading over the surface. The causes of the strong correlation found between foam-killing and spreading are discussed. 2 tables, 1 figure, and 31 references. E.S.

PATTLE, R. E. The control of foaming. II. The breakdown mechanisms and volume of dynamic foams. J. Soc. Chem. Ind. (London) 69, no. 12: 368-71 (December, 1950).

The mechanisms controlling the volume of foam formed by air bubbling continuously through a liquid have been studied. Examples are given in which one—coalescence of bubbles within the foam—or another—bursting of bubbles at the top of the foam—predominates. The effect of alcohols in enhancing foaming, as well as in destroying foam, is noted. The effect of the gas-flow rate on foam volume has been investigated and is found to differ from liquid to liquid. No simple relation between the two exists. In the present state of our knowledge the foam volume under any given circumstances can be found only by experiment. 5 figures and 4 references. E.S.

FOLDING BOXES

ANDRE PAPER BOX COMPANY, *San Francisco.* Andre opens new plant . . . folding boxes from laminated board. Am. Boxmaker 40, no. 1: 13-14 (January, 1951); Paper Ind. 32, no. 11: 1168-9 (February, 1951); Paper Trade J. 132, no. 6: 14, 16 (Feb. 9, 1951); Boxboard Containers 69, no. 698: 6-8, 10 (February, 1951); Fibre Containers 36, no. 1: 88, 90 (January, 1951); Am. Paper Converter 25, no. 2: 14, 48 (February, 1951).

The Andre Paper Box Co. has announced completion of a new half-million dollar factory at San Leandro, Calif. The company is unique in the industry

because of its volume production of folding boxes from board that is first web-laminated with printed paper or other material. High-speed, four-color rotary aniline presses print the desired design in register for cutting and creasing presses on roll-fed paper. This is then automatically laminated to roll-fed boxboard. The history of the development of this process is traced, and the machine employed, the ANDRE-matic Laminator, is described and illustrated. Features of the laminator include electric-eye registration control, special anticurling safeguards, and automatic sheeting and stacking. 4 illustrations. M.W.

THE GARDNER BOARD AND CARTON COMPANY. How paperboard and folding cartons are manufactured at Gardner. This is Gardner; fiftieth anniversary, 1900-1950: 27-57 + 2 col. plates [c1950] *cf.* B.I.P.C. 21: 384.

The 50th anniversary volume of the company includes an illustrated description of the processes involved in the manufacture of folding cartons, from the raw material through all stages of processing to development and research. Excellent photographs of the machinery and a diagrammatic flowsheet are included. E.S.

FORESTS AND FORESTRY

FIXMER, F. N. Progress report mechanical thinning experiment in jackpine on the Mosinee Industrial Forest. Pulp Paper Mag. Can. 51, no. 13: 120, 122 (December, 1950).

Data are given on mechanical thinning experiments with different disking methods in overstocked jack pine areas in 1947 for avoiding stagnation of growth and shortening the rotation for pulpwood at a reasonable cost. The remeasurement of the plots in 1949 showed that the 3-foot spacing is making the best over-all show; however, the data are not yet conclusive. 4 tables. E.S.

GREELEY, W. B. Rational approach to forest practices on private lands. Paper Trade J. 131, no. 23: 18-20 (Dec. 7, 1950).

Although the spread of forest management which is now under way all over the United States is admittedly uneven and ragged, results are being obtained and more trees are grown every year. The author considers the rational approach to forest practices on private lands to be the co-operation with the tide of education and the initiative which is now running through the woodlands. Woodland owners are learning rapidly that it pays to grow trees. E.S.

HOLT, L. The TreeP planting machine. Pulp Paper Mag. Can. 51, no. 13: 124, 126 (December, 1950).

A brief description of the TreeP is given, a planting machine designed for difficult sites which was developed by J. E. Davis of Syracuse University. Although machine planting is slightly more expensive than hand planting, the higher survival rate with the former actually results in planting at less cost. 1 tables and 3 illustrations. E.S.

SCHULENBERG, ALBRECHT FRIEDRICH VON DER. Questions of provenance with relation to pulpwood. Paper and Timber (Finland) 32, no. 12: 387-92 (December, 1950). [In English]

The author describes silvicultural experiments with central European spruce and American lodgepole pine in Germany and northern Europe, with particular emphasis on the importance of seeds of certified origin obtained from reliable dealers. 6 illustrations and 4 references. E.S.

TINKER, E. W. The business of growing trees for the pulp and paper industry. Paper Trade J. 131, no. 24: 30, 32 (Dec. 14, 1950).

Although permanent forest production as an essential integral part of operations has been accepted by the pulp and paper industry on a national basis, there has been only a limited effort to obtain public recognition of this evolution; private forestry programs are still handicapped by suspicions and antagonisms. The need for the correction of these conditions and the training of highly skilled, professional foresters is emphasized. E.S.

GROUNDWOOD MILLS

ANON. The new groundwood mill of A/S Embretsfos Fabrikker. Norsk Skogind. 4, no. 11: 349-50 (November, 1950). [In Norwegian]

The old groundwood mill was destroyed by fire in August, 1948; rebuilding started immediately, and in June, 1950, the new mill began to operate. The new equipment includes two Roberts grinders, Jönssen and Cowan screens, one Haug refiner, and Lindblad thickeners. 2 illustrations. E.S.

GROUNDWOOD PULP

KLEMM, KARL HEINZ. Recent ideas in the field of the manufacture of white groundwood pulp. Wochbl. Papierfabr. 78, no. 19: 567-70; no. 20: 595-8; no. 24: 727-31 (Oct. 15, 31, Dec. 31, 1950). [In German]

Reference is made to the fact that the different use requirements of groundwood pulp involve different qualities; however, quality of groundwood has never been defined, and its standardization is further complicated by such variables as the raw material (wood), pulpstone surface, and motive power, whose effects on quality, although significant, are difficult to estimate. Groundwood pulp is usually a mixture of the nonuniform product of different grinders. It is possible that two unsuitable pulps may yield a mixture suitable for the special use requirements; however, it may also happen that the mixture results in a further decrease in suitability. The lack of suitable testing methods for evaluating grinder performance is stressed. In an attempt to improve present grinding methods, the author studied: (I) the influence in the selection of wood; (II) the use of different wood species; (III) the operation of the grinding process; and (IV) the screening and refining of the pulp. With regard to (I), the advantages of grinding moist wood are stressed. For high yields, wood with a large percentage of summerwood should be selected, whereas for high quality, the light springwood fibers are preferable. Different wood species require different grinding conditions; hence, they should never be ground together. Fiber length does not play the important part it was once assumed to have. In addition to sprucewood, other species also will yield acceptable groundwood pulps; however, their selection should be made in accord with use requirements. Poplar- and firwood are particularly suitable for voluminous papers of high basis weight (wallpaper). Dry pinewood can be employed for newsprint; green pinewood gives foam and rosin troubles. For the manufacture of bulky, absorbent papers, preferably dry wood should be ground, whereas magazine paper and newsprint (which require a smooth surface) should be ground from green, moist wood. With regard to (III), the importance of the pulpstone surface is emphasized. Since the grinding surface gradually deteriorates from one burring to the next, it is impossible to produce a uniform groundwood quality with one grinder. In this case chests with ample capacity are required, which allow the subsequent mixing of large quantities of pulp from different grinding stages. In

case several grinders are used, the burring of the different units should be staggered, so that for each grinder with a sharp stone a counterpart with a blunt stone is operating at the same time. The number of burrings should be kept as low as possible because, during the first three to six hours immediately following the procedure, the pulpstone produces an inferior, coarse quality. Groundwood pulp should be considered a two-component system, involving a fibrous and a fine pulp. By varying the percentages of these two components, different pulp qualities will result which will yield different sheet properties. With regard to (IV), reference is made to the work by Brecht and Schröter (*cf.* B.I.P.C. 16: 451-2). In recent years, the tendency of paper mills with several machines requiring different furnishes has been to prepare different pulp qualities by the appropriate selection of different screening stages in the screening room and no longer by mixing in the groundwood mill. In conclusion, the need for well-trained personnel with technical knowledge in the grinder room is stressed. 4 tables, 9 figures, and 24 footnotes.
E.S.

HEAT

SKAPERDAS, GEORGE T. Heat transfer. Ind. Eng. Chem. 43, no. 1: 99-102 (January, 1951); *cf.* B.I.P.C. 20: 400.

An increased number of books and general papers on heat transfer appeared during 1950. They are discussed under the headings of: convection, boiling, condensation, conduction, industrial applications, and thermometry. 86 references.
M.W.

HISTORY

THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, INC. *Northwestern Division.* Mark first Wisconsin mill site. Fibre Containers 35, no. 12: 123-6 (December, 1950).

Reference is made to the dedication ceremony for erecting a marker on the site of the first mill of Wisconsin which was built in Milwaukee by Joseph Ludington and John Garland in 1848. L. S. Sabatke gave a rather detailed description of the mill; D. C. Everest commented on the vast growth of the industry. 1 illustration.
E.S.

EDWARDS, NINA L. Printers and early Canadian papermakers. Pulp Paper Mag. Can. 51, no. 13: 77-8 (December, 1950).

Printing was firmly established in Canada many years before the construction of the first paper mill at St. Andrews, Que., in 1805. John Bushell of Boston started the Canadian printing industry at Halifax in January, 1752; in those days the problem was to obtain paper, and supplies were probably principally received from England, which involved delays and high costs. Under these circumstances it is not surprising that printers played a prominent part in helping to found a Canadian paper industry. Three printers figured in the inception of three of Canada's most historic paper mills, and two of them, James Brown and Anthony Henry Holland, were forced to abandon printing for papermaking. Their fate and the contribution of William Lyon Mackenzie in establishing papermaking in Upper Canada is recorded. 9 references.
E.S.

SPORHAN-KREMPEL, LORE. History of paper mills in Baden and their watermarks. Wochbl. Papierfabr. 78, no. 23: 696-8 (Dec. 15, 1950). [In German]

Paper as a writing material in Germany in the 14th century was more frequent than generally assumed; most of the early documents were written

on paper made in Italy. It was considerably cheaper than genuine parchment; its cost was only 10% of that of parchment and it was available in sufficient quantities. With the invention of printing from movable type, the requirements for paper rose considerably, and many new mills were built. A brief history of some of the early paper mills in Baden and their proprietors is given. Five reproductions of their watermarks are included. E.S.

INSECTS AND VERMIN

CANADA. DOMINION DEPARTMENT OF AGRICULTURE. *Science Service.* The laboratory of insect pathology, Sault St. Marie, Ontario. Pulp Paper Mag. Can. 51, no. 13: 110-17 (December, 1950).

An illustrated description is given of the new laboratory and its activities. 22 figures. E.S.

IONS

KUNIN, ROBERT. Ion exchange. Anal. Chem. 23, no. 1: 45-6 (January, 1951); *cf.* B.I.P.C. 20: 402.

The literature on ion exchange during 1950 (including some references to 1949) is reviewed under the following headings: reviews, theory, separations, ion-exchange chromatographic analyses, determination of total concentration, removal of interfering elements, physical chemical measurements, and miscellaneous. 86 references. M.W.

KUNIN, ROBERT. Ion exchange. Ind. Eng. Chem. 43, no. 1: 102-8 (January, 1951); cf. B.I.P.C. 20: 402.

A review of developments in the field of ion exchange during 1949 and 1950 is given. 1 figure and 321 references. M.W.

JUTE

CALLOW, H. J. Bleaching reactions with jute fibre. Nature 166, no. 4233: 1040 (Dec. 16, 1950).

Partial acetylation of jute has been shown to retard the rate at which the fiber undergoes bleaching. Acetylation of jute fibers also reduces the rate and intensity of color reactions. The action of light on acetylated jute, unlike raw jute, results in a photochemical bleaching with a concomitant loss of acetyl groups. A comparison of the bleaching rates and color reactions of acetylated jute before and after exposure to light has been made, and it was found that, since no change in either bleaching rate or color reactions occurred, the acetyl groups removed during irradiation are not those primarily responsible for retarding the bleaching reactions of acetylated jute. 3 references. M.W.

MUKHERJEE, R. R., and WOODS, H. J. An x-ray study of the soda-celluloses of jute treated with caustic soda at room temperature. J. Textile Inst. 41, no. 11: T422-8 (November, 1950).

When jute is treated without tension at 20°C. in caustic soda solutions of concentrations greater than 10%, there is a complete transformation of the crystalline material to soda cellulose. Removal of the alkali by washing at room temperature leads to a partial reconversion of the cellulose to the native modification. This effect is ascribed to the stabilizing influence of lignin, which may form cross links between the cellulose chains in the neighborhood of the crystallites, thus creating a disposition in favor of the return to the original configuration after swelling. 7 figures and 7 references. E.S.

LAWS AND LEGISLATION

PARKER, LEO T. Owner or driver . . . which is liable in motor truck accidents? Paper Ind. 32, no. 10: 1078-9 (January, 1951).

Examples from outstanding motor-truck lawsuits are given from which legal rules can be formulated to educate drivers and reduce the damage liability of employers. Emphasis is given to the importance of a contract which contains certain clauses and specific instructions and which the truck driver must sign. All truck drivers should know that they are personally liable in damages to persons injured through their own negligence, although this does not prevent the injured person from suing and recovering damages from the employer. Unless the latter can prove that the truck driver was acting outside the scope of his employment, it is a joint responsibility. 2 illustrations. E.S.

LIGNIN

CLARK, IRA T., HICKS, JAMES R., and HARRIS, ELWIN E. Hydrogenation of Douglas-fir lignin. Tappi 34, no. 1: 6-11 (January, 1951).

The lignin residue from the hydrolysis of Douglas-fir sawmill waste was hydrogenated in batch equipment at the U. S. Forest Products Laboratory at a temperature of 320°C. in the presence of copper chromite and Raney nickel catalysts. Decalin was used as a suspending medium. The product, on the basis of the lignin, was a complex mixture composed of 26.3% neutral oils, 3.8% low-boiling acids and phenols, 1.2% water-soluble materials, 7.3% low-boiling tars, 11.6% pitch, 29.3% unreacted residue, 4.8% water, and 15.7% gases and losses. 3 tables, 8 figures, and 16 references. E.S.

FREUDENBERG, KARL, and DILLENBURG, RÖSEL. Coniferyl aldehyde and sinapin alcohol. Chem. Ber. 84, no. 1: 67-70 (1951). [In German]

Condensation of vanillin with malonic acid in pyridine in the presence of a small amount of aniline for six to eight hours at 60°C. gives 3-methoxy-4-hydroxycinnamic acid. Treatment of the anilide of the acetylated acid with phosphorus oxychloride in toluene gives phenylimide chloride, which on reduction with stannous chloride gives coniferyl aldehyde. Condensation of syringaldehyde with malonic acid in a similar way gives sinapinic acid (I). Reduction of the ethyl ester of acetylated (I) with lithium aluminum hydride gives sinapin alcohol (II). Experiments to prepare (II) from syringin and emulsin give a dimeric dehydrogenation product, insoluble in alkali. 13 references. F.E.B.

MARATHON CORPORATION. *Chemical Division.* Antioxidants, pharmaceuticals, fungicides, and dyes are suggested uses for derivatives of acetovanillone. Chem. Processing 14, no. 1: 18 (January, 1951); *cf.* B.I.P.C. 21: 319.

Acetovanillone is obtained by solvent extraction, distillation, and recrystallization of alkaline degradation products of lignin and is now available in pilot-plant quantities as a product of 98-99.5% purity. Its utilization in the synthesis of various chemical substances is suggested. The characteristic reactions of acetovanillone are presented in tabular form. 1 table. E.S.

NORD, F. F., and SCHUBERT, WALTER J. Enzymatic studies on cellulose, lignin and the mechanism of lignification. Holzforschung 5, no. 1: 1-9 (1951). [In English; German summary]

This is a summary of the authors' latest research discussed in previous American publications (*cf.* B.I.P.C. 20: 491; 21: 92, 170-1). 8 tables, 3 figures, and 33 references. E.S.

LIME AND LIMESTONE

GIBBS, RALPH E. How to determine the economical length of the rotary kiln. Paper Ind. 32, no. 10: 1084-5 (January, 1951); *cf.* B.I.P.C. 21: 171.

Equations, one graph, and two tables are presented with data for determining the economical size of a rotary kiln. The economical length of a kiln will depend upon the cost of the fuel, all other conditions remaining constant; any factors which tend to increase the cost of the fuel will favor an increase in the kiln length. 2 tables and 1 figure. E.S.

NOLL, W. Semicalcined dolomite. Angew. Chem. 62, no. 23/24: 567-72 (Dec. 21, 1950). [In German]

The thermal dissociation of dolomite and the properties of the dissociation products are discussed. The advantages of a semicalcined German dolomite (I) with approximately 27% reactive magnesium oxide for the manufacture of fiberboards of the "Heraklith" type are pointed out; (I) exhibits the same reactivity as causticized magnesite with a magnesium oxide content of approximately 90%. 2 tables, 11 figures, and 22 footnotes. E.S.

MACHINERY—BEATERS

KRIEGER, J. Basalt lava beater tackle. Wochbl. Papierfabr. 78, no. 22: 662-4 (Nov. 30, 1950). [In German]

A brief outline of the occurrence of basalt lava in Germany and the properties of the products from different deposits is given. The most suitable lava for the manufacture of beater tackle is very porous (nephrite); the pores should be distributed as evenly as possible. The inventor of the basalt beater tackle was the papermaker Wilhelm Schmidt, to whom domestic and foreign patents were granted in 1899. Beaters are equipped with either a stone roll and stone bedplate, in which case a high-grade pulp with long, fine fibers results, or with rolls provided with steel or bronze bars and a stone bedplate, which combination gives a shorter and somewhat freer pulp. The advantages of the stone tackle for the beating of kraft, bag, glassine, greaseproof, tissue, cable, and other papers are discussed; the stone tackle results in fibrillation but does not cut the fibers. Beating is accomplished in approximately half the time required by the metal tackle, and a considerable saving in power is realized. 2 figures. E.S.

MACHINERY—DRYERS

ALICO, INC. Alico Evenray mat drier. Printing Equip. Engr. 81, no. 3: 128-9 (December, 1950).

A brief description of the Alico Evenray stereotype mat drier is given, which is designed to preshrink and set high-moisture content mats under controlled conditions. Infrared heat is applied equally on both sides of the mats; the vertical position employed permits moisture to escape freely from both sides. Mats treated in the drier and subsequently formed in the Sta-Hi former are said to permit the casting of plates with excellent printing qualities, particularly with reference to halftone illustrations. 2 illustrations. M.W.

ANON. Insulating dryer roll ends saves steam. Paper Ind. 32, no. 10: 1079 (January, 1951).

Bare metal drier ends are the sources of considerable heat loss. Standard Asbestos Mfg. Co., Chicago, applied two inches of mineral wool insulation cement in three layers to both ends of each steam-heated drier, thereby saving more than 90% of the potential bare-surface heat radiation. 1 illustration. E.S.

ATTWOOD, B. W., and SMITH, S. F. An experimental machine for investigation of the drying process. World's Paper Trade Rev. 134, no. 20: 1425-32, 1437-44 (Dec. 7, 1950); *cf.* B.I.P.C. 16: 330-1.

An experimental drying machine and the operating procedure are described in considerable detail. The machine was designed to reproduce mechanically the full-scale drying process and to keep all important variables under control so that the effect of each variable could be studied individually. The main purpose was the investigation of the influence of certain variables on the drying rate in board machines; the following variables had to be kept under control: length of time of contact of each sheet with the drying surface during each half cycle; length of time the sheet is not in contact during each half cycle, number of drying cycles, temperature of drying surface, temperature and moisture content of air surrounding the sheet, velocity of air over the sheet, pressure of sheet on drying surface, and pressure of felt on sheet. In addition, the machine had to be suitable for experimentation with a wide range of papers and boards and also had to be able to operate without any felts. The machine under discussion met almost all these requirements. The plotting of the results on curves, the reproducibility of results, examples of work done by the machine, a comparison of the experimental machine results with performance data of the drier section of an actual paperboard machine, and differences between the drying process on the experimental machine and paper- and board-machine drier sections are discussed. 14 figures and 3 references. E.S.

LOUGHEED, E. H. Application of Pusey and Jones dual revolving syphons to newsprint machine dryers at Pine Falls. Pulp Paper Mag. Can. 51, no. 13: 95-8 (December, 1950).

The speeding up of two newsprint machines at Pine Falls in 1947 resulted in increased drier-motor loads and difficulties in condensate removal which caused sudden speed drops and sometimes serious drier-gear breakages. The driers were originally equipped with No. 23 Pusey-Jones steam joints, adjustable siphons, and the Penberthy condensate-removal system; all driers are geared together and driven at two points by Harland sectional motors. The very satisfactory experimental performance of two new Pusey-Jones No. 40 steam joints with dual revolving siphons on the 5th and 43rd driers of one machine led to the decision to install this equipment as rapidly as possible on all driers, with the exception of the lead drier, the four felt driers, and the sweat drier. The new joints and their installation on one machine over a 13-week period during Sunday shutdowns are described; the second machine was then similarly equipped. The operation of both machines has been very satisfactory and steady; machine speeds could be safely raised and the average drier load decreased almost 40%. Maintenance on the new joints and siphon equipment has been very light; the driers are fully drained, and practically no water can be found in them on a Sunday inspection. 6 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

BARTLETT, GUY. Electrical and allied developments during 1950. Gen. Elec. Rev. 54, no. 1: 15-60 (January, 1951); *cf.* B.I.P.C. 20: 405.

The annual review of developments in the electrical field for 1950 is presented. The section on paper (p. 34) deals with the installation of the first three short-roll paper tensiometers on a board machine. The article is profusely illustrated. E.S.

MACHINERY—FELTS

[HEIM, KARL] Maintenance of wet felts. Wochbl. Papierfabr. 78, no. 22: 659-61 (Nov. 30, 1950). [In German]

Directions for the washing of felts on the machine with Voith or Vickery felt conditioners during operation or when the machine is running idle are given. In the case of fine paper manufacture it is essential that the felts are periodically removed from the machine and washed in separate felt-washing equipment. In each case it is important that the temperature of neither the washing solution nor rinse water exceeds 50°C. 2 diagrams. E.S.

MACHINERY—FILTERS

MILLER, SHELBY A. Filtration. Ind. Eng. Chem. 43, no. 1: 85-9 (January, 1951); *cf.* B.I.P.C. 20: 405.

The author reviews new contributions to filtration theory and equipment advances of 1950. 1 illustration and 151 references. M.W.

MACHINERY—HOODS

SPOONER, W. W. New trend of design in paper making machinery. World's Paper Trade Rev. 134, no. 15: 1041-2, 1047-9 (Nov. 2, 1950); *cf.* B.I.P.C. 20: 873.

An improved design of the Spooner drying hood for Yankee machines is described, which involves a redesigned pressure chamber and nozzles, resulting in a smaller drying circuit and higher evaporating efficiency, and the construction of the hood from various sections. 7 figures. E.S.

MACHINERY—MIXING APPARATUS

RUSHTON, J. HENRY. Mixing. Ind. Eng. Chem. 43, no. 1: 111-14 (January, 1951); *cf.* B.I.P.C. 20: 406.

The author presents a review of the year's literature on agitation and mixing. 1 illustration and 39 references. M.W.

MACHINERY—PACKAGING MACHINERY

ANON. Precision pouch maker. Modern Packaging 24, no. 5: 91-3 (January, 1951).

A new compact machine which fills foil-laminated envelopes with a powder used in making dental impressions has been developed. The machine takes the pouch material from a roll, discharges filled and sealed packages, and meets the requirement of a 0.5-gram tolerance in the amount of powder to be put in the envelopes. The package material (a heat-sealable lamination of aluminum foil, Pliofilm, and glassine) and the operation of the machine are described, and some design features of the pouches are outlined. 5 illustrations. M.W.

ANON. Versatile in-line carton maker. Modern Packaging 24, no. 5: 96-103 (January, 1951).

A packaging machine is described which provides, in a single pass of roll-fed stock through a single, continuous, in-line operation, multicolor rotogravure printing, cutting, flat-die creasing, automatic stripping, and the discharge of finished folding-carton blanks ready for immediate setup and use. The essential features of the machine are a mechanism for shifting from continuous to intermittent feed at the point where the web enters the cutting and creasing unit, in such a way as to permit the use of flat-bed steel-rule-and-furniture dies and a continuous rotary stripping mechanism. The background of development, the details of operation, and the advantages of the new machine are discussed. It has been used to produce a new carton for Du Pont Duco cement. 13 illustrations. M.W.

DOEPEL, W. Lynch Corporation announces new Model E Morpac paper packaging machine. Paper Mill News 74, no. 3: 52 (Jan. 20, 1951); Paper & Paper Products 92, no. 9: 12 (Jan. 20, 1951).

This new paper packaging machine can be used to package ream paper, pads, tablets, books, and the like; it will accommodate a size range from 5½ × 7½ × ¾ inches to 10 × 5 × 5 inches. One operator feeding individual reams into the machine causes the unit to wrap completely and seal an average of 900 to 1000 packages per hour. The average amount of kraft wrapper material saved per package has been 33.3%, and sealing tape has been eliminated by the use of liquid adhesive on all seams, which results in a dustproof wrap. The machine is sturdily built with simplified control and is dependable for heavy-duty usage. It is claimed that 64 hours of labor per day are saved by the use of this equipment. 1 illustration. M.W.

MACHINERY—PULPERS

EDGE, JACOB V. The selection of a pulper. Paper Trade J. 131, no. 26: 20, 22 (Dec. 28, 1950); Paper Mill News 73, no. 52: 9-10 (Dec. 30, 1950); Southern Pulp Paper Manuf. 14, no. 1: 44, 48 (January, 1951).

The functions of a pulper comprise the mechanical and hydraulic disintegration of the stock until it is sufficiently small to be passed on to the refining operation. The requirements of a good pulper are outlined, including correct shape for efficient operation, proper construction materials and design of drive, and stock extraction through the smallest holes possible to make it suitable for later refining. The design should be such that full advantage of hydraulic disintegration, not just at the impeller, but everywhere in the tub can be taken, and that the pulpers can be used in many locations, including machine rooms and finishing rooms, for treating waste paper and broke. Reference is made to the four-lobed Downingtown pulper, which is claimed to fulfill these requirements. 1 illustration in the first reference. E.S.

MACHINERY—REFINERS

FRASER (LONDON) & COMPANY. The "Resco" refiner; details of the new method of filling. World's Paper Trade Rev. 135, no. 1: 44, 46 (Jan. 4, 1951).

Brief reference is made to the advantages of the Resco conical refiner with the Dawson "Stay-put" method of filling the shell bars with a special composition of white metal; postwar models are equipped with ball and roller bearings in separate housings. The standard refiner is built with the shell in two horizontal parts in nine different sizes with either long- or short-taper plugs. E.S.

MACHINERY—SAND TRAPS

CHESTER, C. A. Laboratory sand table experiments. World's Paper Trade Rev. 134, no. 17: 1189-98, 1203-12, 1214, 1218 (Nov. 16, 1950).

A laboratory investigation has been made of some of the more fundamental factors involved in the settling of dirt from a fiber-water suspension on a sand trap or riffler. Using dirt of a standard controlled particle size made from ground coal (0.02-0.05 cm. in diameter) and a standard bleached sulfite wood pulp (unbeaten), the effects of limited variations in working depth, horizontal laminar rate of flow, fiber-water ratio, different types of baffling, temperature, beating, fiber quality, and dirt-particle size have been investigated on a laboratory sand trip. Through a Perspex side in the table, observations have also been made of the flow behavior and mechanism of dirt settling. The best results were obtained on a sand trap (regardless of the table size and quantity of fiber) lined with old machine wet felt with one-inch layers of stock at 1% consistency moving above it at a horizontal laminar speed of approximately 6.5 inches per second. A rise in the temperature of the stock water increased the efficiency, but beating caused a marked decrease. Wire gauze can act as quite an efficient sand trap bottom, but no advantage is gained by inserting baffles at intervals down the trap. When the flow over a sand trap is nonturbulent, dirt of the order used settles only where a partial fiber-water separation occurs near a solid surface, and its rate of deposition varies directly with the particle diameter. The same efficiency can be fully realized in mill practice, provided these optimum conditions are closely maintained. No critical values have been obtained, but intelligent application of the figures will indicate the margins and directions of permissible variations. 10 tables and 14 figures. E.S.

MACHINERY—SAWS

REINEKE, L. H. Sawteeth in action. Paper Trade J. 132, no. 4: 16, 18-20, 22, 26, 28-31 (Jan. 26, 1951).

A study of the basic relationships between the physical characteristics and strength properties of wood and the cutting action and mechanical forces involved with various types of cutting tools has been conducted by the U. S. Forest Products Laboratory. All machine cutting of wood is considered as a repetition of a cycle, with the cut made by one tooth or knife considered as one cycle. From this basic concept, research equipment was designed which is based on the action of a pendulum. The dynamometer which was so designed and its operation and calibration are described. The information obtained, which is outlined, led to the development of the Forest Products Laboratory Duo-Kerf rip saw. This experimental saw offers smoother surfaces, reduced power requirement, increased accuracy, and reduced kerf over the conventional saw. 16 figures and 2 references. M.W.

MACHINERY—SCRUBBERS

KESTNER EVAPORATOR AND ENGINEERING COMPANY, *London*. Calder-Fox scrubbers; impingement type mist eliminator. World's Paper Trade Rev. 134, no. 15: 1016 (Nov. 2, 1950).

Brief reference is made to the Calder-Fox mist eliminator for the scrubbing of gases, and the principle of operation is explained by a typical unit for the elimination of sulfuric acid mist suspended in the fumes from steel-strip pickling lines. 1 table and 1 diagram. E.S.

MACHINERY—SLITTERS AND WINDERS

C. A. HARNDEN, *Hyde, England.* "Harnden" British precision slitting and re-winding machines. World's Paper Trade Rev. 134, no. 22: 1578 (Dec. 21, 1950).

Brief reference is made to new slitter and cutter constructions for paper and cellophane and to new winders for narrow coils, adhesive tapes, and metallic foils; another specialty is a patented web guider with a very wide field of application. E.S.

MACHINERY—STUFFING BOXES

HEMPHILL, J. W. Do's and don'ts of packing practice. Paper Ind. 32, no. 10: 1080-3 (January, 1951).

Following a brief discussion of the fundamentals of packing practice, directions for the correct packing, adjusting, and lubricating of stuffing boxes are given. Data on packing friction, the packing of flanged surfaces and boiler gaskets, and the application of different types of materials according to use requirements are also given. 1 table and 4 figures. E.S.

MACHINERY—VATS

WILLIAMSON, HARRY. Paper and paperboard making. IX-X. Cylinder machine . . . The use of baffleboards. Parts 1-2. Paper Ind. 32, no. 8: 867-8; no. 9: 967-9 (November, December, 1950); *cf.* B.I.P.C. 21: 153.

The author discusses the problem of baffleboard arrangement in the receiving compartments of the various vats in the operation of a multiple-cylinder machine making folding boxboard from different types of stock for controlling the flow force of the fiber-water suspension and obtaining even distribution over the circle formation area of the wire mesh. Three different arrangements are described, including (*a*) counterflow vats for filler stock using mixed papers as furnish, (*b*) counterflow vats for subliner stock using flyleaf shavings of semigroundwood and semiclay, and (*c*) counterflow vats using bleached sulfite and soda pulps with clay loading. 4 figures. E.S.

MATERIALS HANDLING

ANON. Dempster-Dumpster truck system handles many containers—saves money. Paper Mill News 74, no. 3: 67-8 (Jan. 20, 1951).

The merits of the Dempster-Dumpster system of materials handling are discussed. Its flexibility and economy are a result of the fact that one truck can service any required number of truck bodies of variable designs and sizes, each suited to the particular material to be handled. A list is given of pulp and paper plants in which this system is employed. 3 illustrations. M.W.

FOLKVARD, EGIL, and BERG, WILLIAM. Materials handling in the pulp and paper industries. Norsk Skogind. 4, no. 11: 313-21 (November, 1950). [In Norwegian; English summary]

A study was made of intermittent and continuous materials-handling procedures from the machines in Norwegian pulp, paper, and board mills through the finishing room to storage or the shipping department; time studies were included. Different manual and mechanized techniques are dis-

cussed, and possibilities for simplification and improvements are pointed out. A brief comparison with conditions in Finnish and Swedish mills is made. 9 figures. E.S.

MEDDICK, W. A. Power material-handling equipment aids in combating manpower shortages. Paper Mill News 74, no. 3: 65, 74 (Jan. 20, 1951).

The use of industrial power trucks is discussed with regard to the solution of many problems which are likely to develop as a result of war mobilization. The use of power trucks results in a saving in manpower, a reduction of time and cost in handling, and an avoidance of waste. Because they can work in cramped spaces, power trucks permit the complete utilization of storage space. 1 illustration. M.W.

OAKES, RUSSEL F. Roll handling revolutionized by new, simple fork-truck attachment. Paper Mill News 74, no. 3: 49-50 (Jan. 20, 1951).

A new attachment for fork-lift trucks, called the Bartel Device, handles the rolls in a vertical position and assures economy of space by eliminating use of dunnage strips and blocks. The operation is said to make damage to paper and injury to workmen virtually impossible. A detailed description of the device and its operation is given; it is manufactured by the Clark Equipment Co. 6 illustrations. M.W.

SOLLENBERGER, R. C. The profits of mechanized handling. Paper Mill News 74, no. 3: 44, 46 (Jan. 20, 1951).

The author presents a discussion on the various ways in which mechanized equipment has been of benefit to industry and workers, and stresses the importance of mechanized handling in wartime production. M.W.

WRIGHT, ROBERT E. Materials handling. Ind. Eng. Chem. 43, no. 1: 108-11 (January, 1951); *cf.* B.I.P.C. 20: 408.

The recent literature is reviewed under the headings: liquid and gas handling, solids handling, and miscellaneous materials-handling devices. 5 figures and 31 references. M.W.

MATERIALS OF CONSTRUCTION

CHEMICAL ENGINEERING. Construction materials in the paper industry. Part IV—Alkaline pulping. Chem. Eng. 58, no. 1: 217-18, 220-2, 224-6 (January, 1951); *cf.* B.I.P.C. 21: 325.

The following materials are evaluated with respect to their corrosion-resistance properties in the alkaline pulping processes: Worthite, carbon, cements, Durimet 20, high-silicon irons, Chlorimets, iron and steel, rubber, and nickel and nickel alloys. 5 tables and 2 illustrations. M.W.

MOTT, N. S. Stainless steel castings, valves and fittings beat corrosion in paper industry. Paper Trade J. 132, no. 4: 31-2, 34, 36 (Jan. 26, 1951).

The various processes concerned in the manufacture of pulp and paper are considered, and the most effective anticorrosion materials which are applicable to each process are recommended; brief reference is also made to abrasion resistance. Mechanical and physical properties of alloys, alloy recommendations, and chemical composition of alloys are given in a series of tables. 4 tables, 4 illustrations, and 12 references. M.W.

WIHAN, JOSEF. Light steel constructions or cast iron for paper machines. Wochbl. Papierfabr. 78, no. 23: 690-1 (Dec. 15, 1950). [In German] *cf.* B.I.P.C. 21: 175.

With reference to the article by Wintgen on the same subject, the author points to certain advantages of cast iron, particularly where vibration problems are concerned. In his opinion, cast iron still has a very definite place in paper-machine construction and will not be readily replaced by lighter steel. E.S.

MICROSCOPY (ELECTRON)

HAMM, F. A. Electron microscopy. Anal. Chem. 23, no. 1: 17-20 (January, 1951); *cf.* B.I.P.C. 20: 408.

Following a brief resume of the latest trends in electron microscopy, a review of the literature during 1950 (including a few earlier references) is given under the following headings: instruments, applications, foreign developments, and future developments. 61 references. M.W.

MILL MANAGEMENT

ANON. Marathon Corp. and seven labor unions. Boxboard Containers 69, no. 697: 12-14, 16 (January, 1951).

A summary is given of the eighth case study on "Causes of industrial peace under collective bargaining" by the National Planning Association. 3 tables and 1 illustration. M.W.

HERON, ALEXANDER R. Together we work. Paper Trade J. 131, no. 25: 28, 30-2, 34-5 (Dec. 21, 1950).

This is the text of an address at the annual convention of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, in which one of the vice-presidents of the Crown Zellerbach Corp. reviewed the developments in the Pacific Coast labor negotiations from the first sessions in 1934 to the present time; special emphasis is placed on the gradual achievement of understanding and the broadening interest in the fields where employers and employees can work together, such as safety, health protection, welfare, and the sale of more effort to more customers for more uses. The complete absence of mass employment in the usual sense of the word is listed as one of the great advantages of the industry. Each man does his part of the process, and if he fails, there is trouble throughout the operation. Jobs in the pulp and paper industry call for the human sense of responsibility and the human sense of importance. E.S.

TRANSPORT TOPICS. Alton wins truck shop excellence contest. Fibre Containers 35, no. 12: 112-16 (December, 1950).

The equipment, procedures, and records of the efficient motor truck shop operated by Alton Box Board Co. are outlined. For the second consecutive year, the company received the top award in the 101 to 400-vehicle class in a contest sponsored by *Transport Topics*, the trade publication of the motor transport field. The emphasis in the contest was on the quality and range of equipment and the shop facilities in relation to the size of the individual operations, together with the efficiency of the maintenance program as reflected by the operating results obtained. 6 illustrations. E.S.

TURNER, H. M. How can the industrial relations man best serve his company's interest? Pulp Paper Mag. Can. 51, no. 13: 69-73 (December, 1950).

All the accomplishments of a company are dependent upon the performance of all the individuals who compose its employees; hence, the company should be well provided with properly trained and enthusiastic men and women. One of the best ways of serving a company is to help in the selection of its employees, which represents, however, only the first step. Reviewing the performance of employees periodically and systematically is equally as important. Means for encouraging people to want to give their best and for developing team spirit are discussed; brief reference to union-management relations is made. The job of the industrial relations man is to build bridges of understanding between management and employees; he should seek to understand and evaluate the merits of differences. This means that sometimes he will be supporting a contention of the employees, sometimes of management, and frequently he will be trying to change the viewpoint of both. His job is also to assist all employees in gathering a greater insight into and understanding of people and to help management to remember the human factor in all its decisions. E.S.

OAK

FIXMER, F. N. Experiment in mechanical elimination of scrub oak. Pulp Paper Mag. Can. 51, no. 13: 118 (December, 1950).

Reference is made to the use of a Fleco root rake for uprooting scrub oak clumps prior to hand planting jack pine in the cleared swaths in 1950. The cost of the treatment as compared with expected advantages in pulpwood growth is discussed. 2 tables. E.S.

PACKAGING

MODERN PACKAGING. The road ahead. Modern Packaging 24, no. 5: 71-9, 173, 175 (January, 1951).

Following a general review of the production and availability of packaging materials during the last year, a survey is presented of the packaging conditions which can be expected in 1951. The following materials are discussed individually: paper, metals, glass and closures, cellophane, plastics, and other materials (inks, adhesives, rubber, textiles, and wooden containers). The outlook for paper is generally considered good because of an expected increase in the 1950 production of three million tons over 1949. The situation in regard to packaging machinery is also discussed. 2 tables, 3 figures, and 4 illustrations. M.W.

PACKAGING PARADE. 'Rational rations' and how they're packaged. Packaging Parade 19, no. 216: 34-5, 70 (January, 1951).

A listing of component parts of rations and food packets for the U. S. armed forces in combat and operational fields is given. Current specifications which apply to these packages are also listed. 5 illustrations. M.W.

PAPER—COATED

NAZZARO, RALPH T. Plastic coated papers. Am. Printer 131, no. 5: 34-5, 52 (November, 1950); 132, no. 1: 30-1, 59 (January, 1951).

The methods and substances used to make plastic-coated papers are discussed. Thermoplastic materials are considered in five principal groups: (1) vinyl and styrene resins, (2) cellulose bases, (3) polyesters and alkyds, (4) rosin esters, and (5) miscellaneous resins. The following types of coatings are described: emulsion, solvent, and hot-melt coatings, and organosols and plastisols. 3 illustrations. M.W.

PRINTING, PACKAGING AND ALLIED TRADES RESEARCH ASSOCIATION. Ink drying on machine-coated papers. Brit. Printer 63, no. 376: 49 (January-February, 1951).

The information presented in the PATRA Information Leaflet No. 39 is reprinted. This was compiled at a meeting of printing, papermaking, and inkmaking members, who discussed ink quality in relation to the requirements of machine-coated papers. The difference between art papers and machine-coated papers is pointed out. It is concluded that problems should not be encountered, provided the printer uses an ink recommended by an inkmaker, in the prescribed manner. M.W.

PAPER—CONVERSION

KOTTE [H.] Advances in foreign paper conversion. Allg. Papier-Rundschau no. 23: 1119-21 (Dec. 7, 1950). [In German]

The author reviews the laminating varnishes as described by Bennett (*cf.* B.I.P.C. 21: 107-8) and advances in paper and board machine coating discussed by Brown (*cf.* B.I.P.C. 20: 852) and Zonner (*cf.* B.I.P.C. 21: 27). 1 table, 1 diagram, and 3 footnotes. E.S.

PAPER—MERCHANDISING

YOWELL, L. Q. An "over-the-counter" department can increase a paper merchant's sales. Am. Paper Merchant 48, no. 1: 16, 26 (January, 1951).

When Jacobs the Paper Man, a wrapping paper wholesale company in Washington, D.C., began to draw considerable retail trade, the problem of competition with the retail customers was solved by setting up three price levels. The first was the customary wholesale price, the second was a price in line with the general retail trade, and the third, a level between these two, for quantity purchases by customers other than retailers. The over-all business of the company during the past year has increased between 10 and 15% as a result of the "over-the-counter" department. 2 illustrations. M.W.

PAPER AND PULP INDUSTRY

BURGESTAD, F. The Norwegian pulp and paper industry. Pulp Paper Mag. Can. 51, no. 13: 73-6 (December, 1950).

The pulp and paper industry of Norway, postwar problems, and exports are discussed, including statistical figures. 4 tables and 3 diagrams. E.S.

LEWIS, HARRY F. Pulp and paper production accelerated. Chem. Eng. News 29, no. 1: 31-2 (Jan. 1, 1951); *cf.* B.I.P.C. 20: 412.

After a sharp decline early in 1949, production started upward late in 1949 and continued through 1950; activity was sharply stimulated by inventory building and government buying. The general trends in research developments during 1950 are reviewed, including waste elimination and disposal, advances in semichemical cooking, the Chemigroundwood process for hardwoods, chlorine dioxide for bleaching, the utilization of bark and its chemical components, the production of pulps and papers from straw, the development of orange shipping containers coated with diphenyl and a masking agent for improving the fungistatic properties of the board, the use of ethyl vanillate for the cure of histoplasmosis, the application of electron microscopy for the study of pulp fibers, etc. The emphasis on stream improvement and the expansion of existing plants to include waste disposal processes will undoubtedly be retarded by wartime conditions. 1 table. E.S.

PAPER AND PULP MILLS

ANON. $4 million spent at Dryden. Can. Pulp Paper Ind. 4, no. 1: 14-17 (January, 1951).

Brief reference is made to the improvements at the Dryden Paper Co., Dryden, Ont. since 1940 in the wood room, sulfate mill, and paper mill, including the installation of a new Dominion Engineering paper machine. When the changes at present being made in the screen room are completed, the mill will have a yearly production of over 50,000 tons, as compared with its yearly capacity of 19,000 tons in 1940. 10 illustrations. E.S.

ANON. New pulp and paper mill in Costa Rica. Paper-Maker (London) 120, no. 6: 416 (December, 1950).

Brief reference is made to the new kraft bag-paper mill under construction at La Perla, Costa Rica, by Papelera Nacional, S.A. The mill will house two machines for making M.G. and M.F. papers and will use as its raw material the waste from the abaca-fiber industry. All equipment will be supplied by British manufacturers. Papelera Nacional has its own converting plant for the manufacture of kraft bags, and a considerable amount of the new mill's tonnage will be used for the manufacture of cement bags. 4 illustrations. E.S.

EVANS, JOHN C. W. Dryden Paper progresses. Pulp Paper Mag. Can. 51, no. 13: 62-8 (December, 1950); *cf.* abstract above.

An illustrated description of the improvements at the kraft pulp and paper mill (the oldest kraft mill in Ontario and one of the first in Canada) at Dryden is given, including a description of the Dryden limits and methods of woods operation. 12 illustrations and 2 maps. E.S.

MCGINN, E. P. Camp Mfg. Co., Inc.; new Fourdrinier marks progress in 63 year history. Paper Trade J. 131, no. 24: 33-4, 37-8, 40, 42, 44, 46-8, 52 (Dec. 14, 1950).

A brief history of the Camp Mfg. Co. and its integrated lumber and pulpwood operations is given. The kraft pulp and paper mill at Franklin, Va. started to operate early in 1938; the mill uses softwood and hardwood not suitable for lumber, including the barked slabs and edgings from the lumber mill. An illustrated description is given of the pulp cooking, washing, and screening operations; the recovery and causticizing system; the chemical division where tall oil and turpentine are recovered and refined; the paper mill; and the power plant. A new (third) Beloit Fourdrinier paper machine was placed in operation in November, 1950. Details are given of the stock preparation system and the different sections of this machine, which was designed for the manufacture of the lighter grades of kraft paper, such as bag, wrapping, waxing, and asphalting papers, and for an operating speed of 2000 ft./min. 24 illustrations. E.S.

PAPER MILL NEWS. Camp completes $6,000,000 expansion. Paper Mill News 74, no. 4: 8-12, 14, 16 (Jan. 27, 1951); *cf.* abstract above.

An illustrated description of the new paper machine and its building and the additions to the powerhouse is given. 12 illustrations of the machinery. E.S.

PULP & PAPER. Two of Mexico's finest: Lenz mills expand. Pulp & Paper 25, no. 1: 40-2, 44-5 (January, 1951); *cf.* B.I.P.C. 21: 252-3.

An illustrated description of the expansion of the Loreto and Pena Pobre mills in Mexico (Fabricas de Papel Loreto y Pena Pobre S. A.) is given. 15 illustrations and 2 maps. E.S.

PAPER MANUFACTURE

HILL, E. L. Pulp and paper. Repts. Progress Applied Chem. 34: 509-23 (1949); *cf.* B.I.P.C. 20: 333.

A review is given of the developments in 1949 in the pulp and paper industry under the headings: raw materials, pulp production, papermaking, and testing and analysis. 110 references. M.W.

PAPER SIZING

AMERICAN CYANAMID COMPANY. Automatic and continuous emulsification rosin size. Paper Mill News 73, no. 48: 17 (Dec. 2, 1950); Paper Ind. 32, no. 10: 1069 (January, 1951).

Brief reference is made to a commercial unit for the automatic and continuous emulsification of liquid rosin size which will supply a dilute emulsion in as low as 1.5% concentration and which can handle up to 12 tank cars of rosin size per month. The emulsifier is designed to run smoothly day after day. Safety interlocks will prevent starting or shut down the unit when running if some integral part should not function properly. 1 illustration. E.S.

PAPER SPECIALTIES

ANON. Potato chips. Modern Packaging 24, no. 5: 110-13, 168 (January, 1951).

The techniques used by the Blue Star Foods, Inc. in packaging potato chips are described. It is pointed out that high light intensity and high humidity are harmful to the product. Waxed-glassine bags are used to provide protection as well as merchandizing appeal. 8 illustrations. M.W.

ARMSTRONG CORK COMPANY, *Lancaster, Pa.* New prescription liner facing material developed. Packaging Parade 19, no. 216: 17 (January, 1951).

The new prescription liner, called SF-2, developed by Armstrong Cork Co. in collaboration with Dow Chemical Co., is a pigmented saran film bonded directly to a specially processed news pulp. It is described as being superior in total chemical resistance, prevention of vapor transmission, and mechanical properties to any liner previously available. Some figures obtained in comparisons with materials formerly used are quoted. 1 illustration. M.W.

DOWNS, MARTIN L. Asphalt laminated papers. Am. Paper Merchant 48, no. 1: 12-13 (January, 1951).

Most asphalt-paper grades which come under government specifications are purchased under Joint Army and Navy Specification JAN-P-125 which covers waterproof, flexible barrier material. However, Federal Specification UU-P-271 is undergoing revision and, when it is issued as UU-P-271b, will probably supersede JAN-P-125. These specifications have been worked out and maintained by the U. S. Bureau of Standards and the Federal Specification Board with the assistance of the Waterproof Paper Manufacturers Association. A list of types and their end uses, along with the various physical requirements, are presented in tables. Federal Specification UU-P-147 covers building papers from Class A, with a high degree of water vapor resistance, to Class D, with a high degree of water-vapor permeability. A brief description of the four classes is given. 2 tables. M.W.

"FOURDRINIER." Printers' paper preferences. Paper Making and Paper Selling 69, no. 3: 12-13 (Autumn, 1950).

The differences between cream wove and M.F. printing paper are discussed, and the advantages of the former for fine printing work are outlined. 2 illustrations. E.S.

GOGGIN, JOSEPH D. Plastic stereo molding blanket. Printing Equip. Engr. 81, no. 3: 75, 94-5 (December, 1950); *cf.* B.I.P.C. 21: 255-6.

Brief reference is made to the advantages of the plastic stereotype molding blanket, a product of the research of the American Newspaper Publishers Association; favorable reports on the use of the blanket are included. E.S.

PAPER PLATE ASSOCIATION. Campaign to boost sales of plates. Am. Paper Merchant 48, no. 1: 18 (January, 1951).

The Paper Plate Association's promotional plan aimed to increase sales of plates and allied tableware in retail store outlets through the medium of better mechandising is outlined. M.W.

PAPER SALES. Pressure-sensitive tapes. Paper Sales 11, no. 1: 16-18, 20, 36, 38; no. 2: 14-17, 32, 34, 36, 38 (January, February, 1951).

In a series of 29 questions and answers, the facts concerning pressure-sensitive tapes are presented. Some of the points which are considered include characteristics, kinds of backing, adhesives, color, printability, market opportunities, and uses. 13 illustrations. M.W.

RUNDELL, FORREST. Strength and dignity combine in high-grade bond papers. Inland Printer 126, no. 3: 49-50 (December, 1950).

The characteristics of the various grades of sulfite and rag bond papers are described. M.W.

YOST, D. M., and AIKEN, W. H. The effect of certain latex variables in beater addition of nitrile rubber latices. Tappi 34, no. 1: 30-9 (January, 1951).

A number of nitrile rubber-latex variables have been studied to determine their effect on beater impregnation. The work was limited to latices prepared with one basic polymerization system, and to a medium-beaten Scandinavian unbleached kraft pulp. The results of this study indicate that a rubber of medium acrylonitrile content and molecular weight, and with no additional stabilization after polymerization, will give optimum properties. When alum was used as the coagulating agent, optimum properties were obtained at a final pH range of 4.5 to 5.5. Coagulation may be carried out with either dry alum or alum solution. Somewhat better properties were obtained by coagulating with a 100-20 mixture of alum-sodium hydroxide at a final pH of 5.5 to 6.5. Coagulation with acids and acid-alum mixtures, as well as final pH values much above 6.5, are to be avoided because these conditions cause sticky sheets. Vulcanization of the latex after coagulation appears to give a beneficial effect, but this is more than offset by the losses in properties brought about by the extra stabilizer which must be added along with the curing ingredients. Plasticizers for the latex improved the drape and softness of the sheet, but at the expense of strength. Both stretch and edge tear were increased roughly as a straight-line function of the amount of latex added, whereas tearing strength progressively decreased. Burst-

ing strength increased to a maximum, whereas tensile strength tended to decrease. Dilution of the latex from 30.7 to 3.6% before addition to the pulp did not change the properties appreciably when the pulp concentration remained constant. 13 tables, 9 figures, and 5 references. E.S.

YOST, D. M., and AIKEN, W. H. Effect of certain papermaking variables upon beater addition of nitrile rubber latices. Tappi 34, no. 1: 40-8 (January, 1951).

The effect of a number of papermaking variables upon beater addition of a nitrile rubber latex has been studied. Latex may be added to the pulp either before or after beating, but it should not be coagulated until near the end of the beating process. The amount of latex that could be incorporated in a beaten unbleached kraft pulp was greatly increased by reducing the pulp consistency. For latex contents up to 33 parts per 100 parts of pulp, better properties were obtained at lower pulp consistencies. The amount of latex that could be incorporated into unbleached kraft pulps was increased by beating. Unbeaten bleached kraft pulps showed a greater tolerance for latex than did unbeaten, unbleached kraft pulps; however, beating the bleached pulps did not increase their tolerance for latex. Addition of latex increased the elongation and reduced the stiffness of all pulps tested. The effect on other properties depended to a great extent on the type of pulp used. Addition of latex to pulp showed little effect on drainage properties. The stretch and tearing strength of latex-containing sheets relative to sheets without latex remained unchanged with variation in basis weight. Edge tear, bursting strength, and tensile strength, on the other hand, showed relatively higher values at the higher basis weights. Spot checks indicated that pulp to which latex has been added may be dyed. With the two colors tested, best physical properties were obtained when the color was added after the latex but before the alum. The addition of clay to pulp-latex systems reduced physical properties to the extent that its use does not appear advisable. The addition of rosin size appeared to give no difficulties in latex-pulp systems. It appeared that wet broke can easily be reworked without difficulty or appreciable reduction of properties. Dry broke, on the other hand, was difficult to redisperse and gave substantially reduced properties. A mill run made with the latex developed in these studies showed excellent correlation with laboratory studies on pulp-latex and further demonstrated the practicability of these mixtures. 10 tables, 11 figures, and 1 reference. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

SOCIETY OF DYERS AND COLOURISTS. *Co-ordinating Committee for Fastness Tests.* Observations on I. H. Godlove's "Uniformity of grading of the American, British and German light-fastness standards." Am. Dyestuff Reptr. 39, no. 26: P912 (Dec. 25, 1950); *cf.* B.I.P.C. 20: 657-8.

Comments are made on the conclusions derived from the study previously presented, because the American standards are based on a different concept from that of British and other standards, and the criterion of fading is also different. These differences are discussed, and some specific inconsistencies in the original study are pointed out. M.W.

PHYSICAL TESTING—ODOR TRANSMISSION

CARTWRIGHT, L. C., and KELLEY, PATRICIA H. Odor permeability of glassine. Modern Packaging 24, no. 5: 121-2, 178 (January, 1951).

In testing glassine for odor and flavor permeability, a fairly good correla-

tion was obtained between organoleptic and instrumental evaluations. A detailed outline of the testing procedure is given, in which the Cherepow method and the TAPPI turpentine test (TAPPI Standard Method T-454 m-44) are employed. 1 table, 2 figures, and 8 references. M.W.

MULDOON, T. J., COUCH, R. DE S., and BARNES, H. M. Organic-vapor transmission test. Modern Packaging 24, no. 5: 123-6 (January, 1951); *cf.* B.I.P.C. 21: 256.

The complete text of the paper, which appeared previously as an abridgment, is given. 3 tables and 5 figures. M.W.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

EVANS, A., and KEILLER, C. Q. An apparatus for measuring the permeability to water vapour of bituminous emulsion films. J. Soc. Chem. Ind. (London) 69, Suppl. Issue no. 1: S1-3 (1950).

A description is given of an apparatus for measuring the permeability to water vapor of films formed from bituminous emulsions of the clay-stabilized type. These have a relatively high permeability compared with ordinary bitumen, and a fairly simple apparatus is therefore adequate. 2 tables, 3 figures, and 1 reference. E.S.

PLASTICS

CRAWFORD, J. W. C., *and others.* Plastics. Repts. Progress Applied Chem. 34: 399-455 (1949); *cf.* B.I.P.C. 20: 339.

Members of the Plastics Group of the Society of Chemical Industry review the recent developments in plastics, for the most part those in 1949, as follows: Crawford, J. W. C. Polymerization products (including processes; molecular size; plasticization; olefin polymers; polystyrene; polyvinyl chloride; polyvinyl esters, alcohol, and ethers; fluorine-containing polymers; acrylic polymers; acrylonitrile; polyethenoid polymers; and miscellaneous polymers)—126 references, p. 399-422; Whitehouse, A. A. K. Polycondensation products (including phenoplastics, miscellaneous aromatic polycondensation plastics, aminoplastics, polyesters, polyamides, polyurethanes, and silicones)—161 references, p. 423-41; Parkin, T. N. Plastics from natural polymers (including cellulose derivatives suitable for plastics; solvents and plasticizers for cellulose derivatives; manufacture, use, and properties of cellulosic plastics; and protein plastics)—140 references, p. 442-55. M.W.

KLINE, GORDON M. The year 1950 in review. Modern Plastics 28, no. 5: 97-8, 100, 102, 104, 106, 108, 154, 157-8, 160, 162, 164, 166-7 (January, 1951).

The author presents a survey of developments in the plastics industry in 1950, and a survey of the year's literature concerning plastics. 8 illustrations and 496 references. M.W.

MODERN PLASTICS. Materials in 1950 and the future. Modern Plastics 28, no. 5: 55-64, 140, 142, 145-6 (January, 1951).

An analysis of the materials situation in the plastics industry is presented. 4 tables and 2 diagrams. M.W.

PLASTICS—PAPER-BASE

ANON. The production of Holoplast. Ind. Chemist 26, no. 310: 495-7 (November, 1950); *cf.* B.I.P.C. 21: 261.

A description is given of the process developed for the manufacture of structural panels, which have outstanding strength characteristics and which

are based on a kraft paper impregnated with a phenol-formaldehyde resin. In the process, a sandwich of impregnated fibrous material is built up which comprises sheets of this material interconnected by a series of rectangular-shaped tubes. Steel bars are introduced into the tubes to maintain their shape under pressure, and the assembly is cured at a definite temperature and pressure. The layout, which is designed to provide a continuous flow from the receipt of the raw materials to the shipment of the finished panels, is described. 5 figures. M.W.

MILLS, E. Blanking of laminates. Brit. Plastics 23, no. 259: 196-7 (December, 1950).

Following a brief general discussion of the three types of laminates, paper-, fabric-, and asbestos-base, an outline is presented of some aspects to be considered if laminated material is to be successfully fabricated. M.W.

POWER

ANON. Power plant reconstruction at Vale Paper Works, Horwich. World's Paper Trade Rev. 134, no. 15: 1054, 1056; no. 18: 1275-8, 1283 (Nov. 2, 23, 1950); Paper-Maker (London) 120, no. 6: 410-11, 413 (December, 1950).

The reconstruction of the power plant of the paper mill of Cooke & Nuttall, Ltd. at Horwich, Lancashire, is described. The five existing boilers were equipped with improved firing equipment, so that only three are operating and carrying the load, whereas the other two are kept for emergencies. The electrical power is now supplied by the North West Electricity Board (grid), and to accommodate the equipment for the supply of purchased electricity, a new substation was erected as an annex to the mill's turbine room. A summary of the new operating conditions is given. 1 diagrammatic layout and 4 illustrations in the first reference. E.S.

BLOEDORN, C. W. Power for the pulp and paper industry. Paper Mill News 73, no. 49: 50, 52, 54, 56 (Dec. 9, 1950).

Under normal, competitive conditions, the cost of power in the paper industry is extremely important and often determines whether a plant operates at a profit or loss. When the relative advantages of generated or purchased power are compared, the power survey of a mill should include all influencing factors, such as type of paper manufactured, source of pulp, cost of fuel, cost of purchased power, reliability of power supply, initial investment and operating cost, space requirements, and availability of skilled personnel; each mill should be treated as an individual case. The author discusses the selection of correct steam conditions and type of turbine to obtain the proper economic balance between power and process steam with flexibility of operation under different conditions. In many cases the electrical demand has been increasing more rapidly than the process-steam demand; by increasing steam pressures and temperatures, a considerable gain in power can be obtained with only a small increase in initial investment. Through the use of higher pressures and temperatures it may also be possible to use noncondensing turbines alone, thereby eliminating the condensing equipment with its concomitant loss in efficiency. As boiler pressures increase, more attention must be given to feed-water treatment, as well as to the economies of heating it in multistage heaters. 7 figures. E.S.

POWER TRANSMISSION

EATON MANUFACTURING COMPANY, *Cleveland, Ohio.* Electromagnetic power transmitter or clutch. Fibre Containers 35, no. 12: 127-9 (December, 1950).

A new method for the transmission of power or the exertion of a braking or clutching effect is described, in which the motion of the power is passed through a magnetic field consisting of a mixture of graphite and powdered iron. When electric excitation is given to this field, the powdered mixture can be quickly changed to a state ranging from frozen to unfrozen, in direct proportion to the amount of electrical power supplied. The new method is incorporated in two basic clutch designs, called the fixed and variable air-gap types, which are described briefly. The advantages and possible applications, including the paper and board industries, are outlined. 4 illustrations. E.S.

PRINTING AND PRINTER'S INK

AREND, A. G. Book papers *v.* television. Paper Making and Paper Selling 69, no. 3: 10-11 (Autumn, 1950).

Reference is made to the possible effect of television on the sale of books (and book paper) in the United States, where television has already diminished book reading. In searching for fresh fields for printing, one small outlet refers to the possible use of luminous printing of publications for night nurses and attendants. E.S.

BIRCHARD, W. H. Paper and printing. Pulp Paper Mag. Can. 51, no. 13: 88-91 (December, 1950).

The author discusses the most important factors which may cause trouble in the printing of paper by different processes, such as moisture content, formation, finish, ink receptivity, offset and strike-through, pick, and mechanical troubles. E.S.

BOUGHTON, FRANK E. Aniline printing, Parts 1-5. Am. Paper Converter 24, no. 9: 10-11, 24; no. 10: 10-11, 26, 30, 32; no. 11: 12-13, 42; no. 12: 10-11, 32, 34 (September-December, 1950); 25, no. 1: 12-13 (January, 1951); Am. Boxmaker 39, no. 10: 8-9; no. 11: 14, 16, 18, 39; no. 12: 22-3, 32 (October-December, 1950); 40, no. 1: 16, 18, 20; no. 2: 23-5, 34 (January-February, 1951); Paper Market: 138-9, 141 (November, 1950); 167-8 (December, 1950); 6-7 (January, 1951) (to be continued); Paper Box Bag Maker: 188-9, 191 (November, 1950); 235-6 (December, 1950); 32-4 (January, 1951) (to be continued).

The field of aniline printing is discussed under the following headings: general, press adjustment, presses and plates, ink problems, drying methods and rollers, and pressroom procedure. 17 figures. M.W.

DELLER, JACK. Ink troubles, their causes and cures. Brit. Printer 63, no. 376: 46-9 (January-February, 1951).

A brief summary of printing problems caused by the use of an ink unsuited to the paper on which it is used is presented. The problems which receive individual consideration include: screen filling, crystallization, mottle, offset, sticking, and wipe. 5 illustrations. M.W.

FUNK, NELSON E. Dry offset printing has advantages for converters. Am. Paper Converter 25, no. 1: 10-11 (January, 1951).

The author describes the dry offset printing process with three and four colors which he helped to develop; an explanation of the platemaking procedure with a magnesium alloy is given. Advantages of the process include

the saving of time and expense and better results on less expensive grades of paper. 1 illustration. M.W.

HARTMANN, MARTIN. Are printing papers able to influence the drying rate of printing inks? Allg. Papier-Rundschau no. 23: 1129-30 (Dec. 7, 1950). [In German] *cf.* B.I.P.C. 19: 719.

Supplementing the previous article, the author emphasizes the significant influence of the uniformity of beating on the ink-drying rate obtained in the printing experiments with different liners of chromo imitation board. The beneficial effect of starch sizing was not confirmed in later experiments. The bleaching degree of the stock may exert an influence in that it is possible that certain residual impurities act as inhibitors in the drying of linseed oil. The author recommends further investigation of these possibilities. 3 photomicrographs. E.S.

WELP, GEORGE. New developments in ink for package printing. Am. Paper Converter 25, no. 1: 14, 40, 42 (January, 1951).

The author discusses the characteristics, ingredients, and latest developments in the various types of inks required to meet the demands of the several printing processes employed and the many materials used in packaging today. The supply situation in the printing-ink industry is also mentioned. M.W.

ZUCKER, MILTON. Some unsolved problems in the printing ink field. Paper Mill News 74, no. 2: 10-11 (Jan. 13, 1951).

The author discusses some of the unsolved problems in the use of printing ink in the letterpress process, such as measuring tack, drying and rub resistance, and printability. In spite of a large number of investigations on these subjects by individuals, corporations, and associations, no absolute methods have yet been developed which would permit the safe prediction on a numerical basis of the behavior of ink on a given job. E.S.

RAW MATERIALS—NON-FIBROUS

POOR, E. N. TAPPI nonfibrous raw materials report—1950. Tappi 34, no. 1: 22A, 24A, 26A, 28A, 30A, 32A (January, 1951); *cf.* B.I.P.C. 20: 422.

Brief reports on the supply and demand situation, price trends, consumption, and outlook for 1951 are given for the following chemicals and nonfibrous raw materials used in the pulp and paper industry: caustic soda, soda ash, lime, sulfur, sulfur dioxide, chlorine, peroxides, rosin, casein, alum and sodium aluminate, glue, starch, dyestuffs, starch-converting enzymes, clay, zinc sulfide pigments, titanium pigments, synthetic resins, wax sizes, plasticizers, and bactericides and fungicides. E.S.

RAYON—VISCOSE PROCESS

GÄRTNER, FRED, and SAMUELSON, OLOF. Emulsion xanthation of cellulose. Part II. Svensk Papperstidn. 53, no. 24: 805-10 (Dec. 31, 1950). [In English; German and Swedish summaries] *cf.* B.I.P.C. 21: 342.

In the previous paper it was shown that different types of cellulose differ in their behavior during emulsion xanthation. To study these differences further, the authors determined the amount of the insoluble residue and its degree of xanthation, as well as that of the xanthate solution obtained during

emulsion xanthation. Cold-purified (I) and a slightly hot-purified sulfite pulp (II), a linter pulp (III), and rayon staple fiber (IV) were used as samples. In the experiments, either the concentration of caustic soda or the amount of carbon disulfide was varied. Mercerized (I) showed a higher degree of xanthation than (II) or (III); in spite of this fact, (I) gave a greater insoluble residue than (II); however, it dissolved better than (III). The degree of xanthation of the insoluble residue obtained during emulsion xanthation, even at very low caustic concentrations, is remarkably high, often more than 0.50. The dissolved cellulose xanthate exhibits an even higher degree of xanthation. 3 tables, 12 figures, and 4 references. E.S.

JULLANDER, INGVAR. Turbidimetric investigations on viscose. I. Svensk Papperstidn. 53, no. 22: 719-25 (Nov. 30, 1950). [In English; German and Swedish summaries]

Following a brief literature review, the author describes the results of some of his studies on the turbidity of viscose (I). The method described by Jullander and Brune (*cf.* Acta Chem. Scand. 3: 1309-17 [1949] and 4: 870-7 [1950]) was used for the measurement of (I); a curve was developed for permitting the conversion to the American standard silica scale. The following results are summarized: (I) does not increase noticeably on aging of the viscose; it is not influenced by coagulation. (I) increases considerably with the resin content of the cellulose (*cf.* Samuelson, B.I.P.C. 20: 422-3); the scattering of the experimental values is of approximately the same magnitude, irrespective of whether the resin content is defined as an ether or alcohol extract. No relationship between (I) and the α-cellulose of the dissolving pulp could be established. A "viscose" was prepared by xanthation of hemicellulose recovered from the waste mercerizing liquor; the solution was very clear, in contradiction to previous literature data. It is impossible to clarify a technical viscose by centrifuging in an ordinary laboratory centrifuge, because of the high viscosity of the viscose. However, after fivefold dilution, the particles causing the turbidity can be partly removed by centrifuging. The light absorption of this sediment in ethanol is similar to that of the alcohol extract of cellulose. By extraction with ethyl ether, the clarity of viscose can be considerably improved. 2 tables, 9 figures, and 25 references. E.S.

VOSTERS, H. L. Filterability of viscose. III. Svensk Papperstidn. 53, no. 23: 771-82 (Dec. 15, 1950). [In English; German and Swedish summaries] *cf.* B.I.P.C. 21: 266-7.

Experimental and general investigations of the filtration process have supported the following results: The general filtration law does not hold for either the constant-pressure or the constant-rate process; the variation of n and K during filtration may be explained by a scouring effect. The Kw (clogging constant) method for quality determination is unsatisfactory; the statistical clogging value CV_{50-250} is more accurate. It does not seem possible to evaluate completely the quality of a viscose by constants based on filtration data exclusively. A combination of filtration and stress-strain properties of the xanthate gel of the viscose is proposed for the characterization of the quality of a given sample. General equations for the constant-rate filtration have been developed in connection with this work. 5 tables, 26 figures, and 12 references. E.S.

RESEARCH

ANON. Utilisation of forest resources. World's Paper Trade Rev. 134, no. 22: 1613-14 (Dec. 21, 1950).

Brief reference is made to the expanded research program of the Canadian

pulp and paper industry, particularly the reorganized Pulp and Paper Research Institute of Canada. E.S.

SAFETY

PERRY, HENRY J. How much does it hurt in dollars? Paper Trade J. 131, no. 25: 21-4 (Dec. 21, 1950).

The high cost of the New York State workmen's compensation in the logging, lumbering, and pulpwood industries has been the subject of great concern and discussion. Workmen's compensation premiums and incurred losses (which constitute part of the workmen's compensation premium) are a cost factor and have an effect on competition in interstate commerce. A series of comparisons has been made between the principal papermaking states of the Union on the basis of rather meager information which indicates the need for more complete studies. The data are tabulated and show a wide variety in accident cost; no analysis of the reasons causing this wide variation is at present possible. Reference is made to the workmen's compensation system used in Quebec and administered by the Quebec Pulp & Paper Safety Association (*cf.* B.I.P.C. 21: 344), which was reduced from $7.00 in 1937 to $1.50 in 1948 for wood operations, as compared with $15.73 for the New York State logging rates. The study of the Quebec system is recommended. 9 tables and 1 figure. E.S.

SCALE MODELS

ANON. Scale model of International's Springhill mill on display. Southern Pulp Paper Manuf. 14, no. 1: 18 (January, 1951).

Reference is made to a diorama of the pulp and paper mill of the International Paper Co. at Springhill, La., in which both the interior and exterior of the mill are shown; it includes accurate replicas of all machinery involved in the process of papermaking. It is actually three dioramas in one: the over-all diorama of the plant and cross sections of the pulp and paper mills. The union of the three-dimensional exhibit with the two-dimensional painting as a background is so skillfully done that it is difficult to determine where the one ends and the other begins. The diorama is the work of H. B. Wright, curator of the State Exhibit Museum at Shreveport, La., where it is now on display. 2 illustrations. E.S.

SEMI-CHEMICAL PULPING PROCESS

RUNKEL, ROLAND O. H. Semichemical pulps. Wochbl. Papierfabr. 78, no. 23: 687-90 (Dec. 15, 1950). [In German]

The author reviews early German efforts for producing semichemical pulps and chemigroundwood and discusses recent developments in the United States. Particular reference is made to the economic significance of the process, including raw materials and forestry considerations; the possibilities for western Germany are discussed. 14 footnotes and a chronologically arranged bibliography for the years 1924-1950, including about 80 references. E.S.

SETUP BOXES

FRA. Calculations for cardboard boxes. (III). Allg. Papier-Rundschau no. 24: 1173-5 (Dec. 30, 1950). [In German] *cf.* B.I.P.C. 21: 345.

A sample calculation is given of the cost of an extension-edge box (upright, covered-lid box) in Germany. 2 tables and 1 illustration. E.S.

HAMILTON, GEORGE. Shoe cartons produced in one continuous operation with inline equipment. Boxboard Containers 69, no. 697: 6-8 (January, 1951).

Frank C. Meyer Company, Inc., one of the largest producers of setup paper shoe boxes in the country, has recently installed in its Lawrence, Mass. plant twin lineups of equipment far advanced in design beyond any other of its kind. Each lineup consists of a series of five units, all operating in line. It is web-fed, and provides for printing, laminating paper to board, die cutting, and automatic stripping. A description of the operation of the unit is given. 5 illustrations. M.W.

SHIPPING CONTAINERS

SHELTON MANUFACTURING COMPANY, INC., *Long Island City, N.Y.* Self-palletizing containers. Fibre Containers 35, no. 12: 129 (December, 1950).

Brief reference is made to the "Self-Stak" container with recessed bottom, which fits over the projecting top of a companion box, thereby effectively locking the boxes together in palletized form; a lid can be provided to cover the uppermost box in a pile. The boxes, when piled, are said to form perfect pallets, so that the need for metal strapping on skids is eliminated. 2 illustrations. E.S.

SHIPPING CONTAINERS—FIBER DRUMS

ANON. Revolutionary fibre drum for liquids. Fibre Containers 35, no. 12: 51-2, 54 (December, 1950); *cf.* B.I.P.C. 20: 840; 21: 114.

An illustrated description is given of the FPEB (fiber-plastic-envelope-boot) fiber drum and its development. 5 illustrations. E.S.

MATHER, GLENN. What's new in fibre drums. Fibre Containers 35, no. 12: 110-11 (December, 1950).

Brief reference is made to four new developments in fiber drums: special types for metal parts and nails, for transporting delicate threadlike fibers within the different departments of textile mills (textile roving cans), for handling dehydrated foods, and the "FPEB" drum for liquids (see preceding abstract). E.S.

SPECTROSCOPY, INFRARED

GORE, ROBERT C. Infrared spectroscopy. Anal. Chem. 23, no. 1: 7-12 (January, 1951); *cf.* B.I.P.C. 20: 427.

A review is given of the literature on infrared spectroscopy which appeared during 1950, including a few earlier references. The general trends have been similar to those reported in the review for 1949. 354 references. M.W.

STARCH

BAILEY, J. M., and WHELAN, W. J. The enzymic synthesis and degradation of starch. Part XI. Isophosphorylase. J. Chem. Soc.: 3573-9 (December, 1950).

Isophosphorylase, isolated from the potato, and claimed by Bernfeld and Meutémédian (*cf.* Helv. Chim. Acta 31: 1724-39 [1948]) to be responsible for the reversible formation of α-1,6-glycosidic linkages in amylopectin, has been prepared by the prescribed technique, and the key experiments of the

above authors repeated. Although this repetition revealed an apparent agreement in some of the experimental data, the present authors came to the conclusion that these experimental results have been misinterpreted by Bernfeld and Meutémédian and that an enzyme with the properties ascribed to "isophosphorylase" does not exist in the potato. 3 tables. E.S.

HOBSON, P. N., WHELAN, W. J., and PEAT, STANLEY. The enzymic synthesis and degradation of starch. Part X. The phosphorylase and Q-enzyme of broad bean. The Q-enzyme of wrinkled pea. J. Chem. Soc.: 3566-73 (December, 1950); *cf.* B.I.P.C. 21: 346.

Q-enzyme, which converts amylose into amylopectin and which, with phosphorylase and glucose 1-phosphate, is responsible for the synthesis of amylopectin, has been isolated (as a stable freeze-dried powder) from the broad bean and the wrinkled pea. These preparations exert the same function as the Q-enzyme of potato. The phosphorylase of bean has also been isolated and shown to be closely similar to that of the potato. It is concluded that the mechanism of starch synthesis in these three plants is the same. Methods of removing α-amylase impurity from phosphorylase and Q-enzyme preparations have been investigated, and a reliable test for α-amylase in the presence of other enzymes is described. The phosphorylase has been almost entirely freed from α-amylase, but a complete separation of this impurity from Q-enzyme has not been achieved. In the course of these investigations the presence of a "debranching" enzyme has been established. 2 tables and 4 figures. E.S.

STATISTICAL METHODS

ANDERSSON, OLLE, and BERGSTRÖM, JAN. A statistical investigation of routine tests on strength properties of pulp and paper. Svensk Papperstidn. 53, no. 23: 783-91 (Dec. 15, 1950). [In English; German and Swedish summaries]

Routine tests over a period of three years in a kraft paper mill on the strength properties of machine-made paper and laboratory sheets prepared from the same pulp have been treated statistically. Standard deviations, and regression and correlation coefficients were calculated, using modern, mechanized equipment (punched cards and a Monroe desk calculator). Monthly averages were plotted against time, and distribution curves and regression diagrams were drawn. With few exceptions, the distribution curves are essentially symmetrical. Those curves which involve clamping of the test strips show a slight skewness, with their tails pointing toward low values. This fact is easy to explain, because faulty testing much more frequently gives too low rather than too high values; oblique clamping is sufficient to introduce this systematic kind of error. The correlation coefficients indicate a poor relation between the tests made on laboratory sheets and machine-made paper. Some relationships between the different tests are discussed; the influence of basis weight on strength properties has also been investigated. 2 tables, 9 figures, and 6 references. E.S.

STEAM POWER

MODEN, F. P. Combustion control. Pulp Paper Mag. Can. 51, no. 13: 92-4 (December, 1950).

The author discusses the fundamentals of combustion control, including water-level and pressure regulation, fuel control, and air-flow control; the paper is written for the benefit of the instrument mechanic and his helper and contains nothing new or phenomenal. E.S.

STRAW

ANON. Making straw into paper. Paper Making and Paper Selling 69, no. 3: 20-3 (Autumn, 1950); *cf.* B.I.P.C. 18: 57.

Following a brief description of the pulping operations at the pilot plant at Orpington, Kent, of the Cellulose Development Corp., reference is made to the use of seven Paxman rotary vacuum filters for washing and thickening the pulp at various stages of the process. The suitability of low-submergence vacuum filters for the Celdecor-Pomilio chlorination process and, for certain applications, of the deep-submergence type (Swedish Kamyr suction filter built by Paxman in Great Britain) is stressed. 7 illustrations. E.S.

TABB, C. B. Straw—bane or boon? Paper-Maker (London) 120, Annual no.: 48, 50, 53 (1950); *cf.* B.I.P.C. 21: 349.

The author discusses the technical problems involved in the manufacture of paper from straw, with particular reference to the unfortunate mistake of attempting the cooking of straw pulp in esparto equipment. The four processes in commercial use for making bleached straw pulp are the sulfate, the soda, the Celdecor-Pomilio, and the monosulfite processes; other methods exist, but do not show any advantages over these four basic methods. To obtain a satisfactory straw pulp, the equipment should be designed from start to finish for this purpose. Straw pulp loses some of its advantages when it is completely dried; slush pulp can be converted to paper with little beating. It is a good plan to dry straw pulp for sale to only 80% consistency because it can then be readily dispersed. Details are given with regard to beating, color, freeness, formation, sizing, presses, drying, and calendering during paper manufacture, and uses of bleached straw pulp for banks and bonds, printings, body papers, and glassine, greaseproof, bag, sensitizing, and semiwhite papers are discussed. E.S.

ULLMANN, G., and BEAN, P. Paper from straw; a survey of earlier efforts. World's Paper Trade Rev. 135, no. 1: 33-6, 41 (Jan. 4, 1951).

Reference is made to the book by L. Piette on the manufacture of paper from straw and many other materials in bulk, supplemented by 185 samples of paper made from the materials either alone or in mixtures. The book was published in German in Cologne in 1838, while the author was a paper manufacturer at Dillingen in Rheinpreussen. Excerpts from the book are translated, particularly those referring to the rag and paper shortage and the suitability of straw as a substitute. E.S.

STREAM POLLUTION

ANON. Fish or factories? Paper Trade J. 132, no. 1: 23-4, 26, 28, 30 (Jan. 5, 1951).

Excerpts from statements made before the Wisconsin River Pollution hearing by officials of various paper mills in Wisconsin are presented. The efforts expended by the mills to minimize the pollution problem are summarized in the statements. M.W.

BLANDIN, H. M., and HOLM, K. H. Workshop on paper manufacturing wastes. Proc. 2d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 60: 155-60 (March, 1946).

A discussion by chemists who represent various paper mills is presented. The problems in each case are outlined, and some corrective measures are described. M.W.

GEHM, H. W., and BLOODGOOD, DON E. Problems in paper mill waste disposal. Proc. 2d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 60: 40-5 (March, 1946).

The variety of substances in different combinations involved in the effluents from different mills represent to some degree individual problems. The following factors common to all mills are discussed briefly: flows and characteristics of receiving waters, uses of receiving water, degree and character of other pollution, processes employed in the mill, physical layout of the mill, type of raw materials employed, size of mill in respect to production, geographical location, operation and personnel, type of equipment, recovery systems, and by-product manufacture. M.W.

KLEIN, L. Sewage, rivers pollution and trade wastes. Repts. Progress Applied Chem. 34: 810-35 (1949); *cf.* B.I.P.C. 20: 351.

The literature, principally that of 1948 and 1949, is reviewed under the following headings: methods of analysis, sewage, river pollution, and trade waste waters. 164 references. M.W.

KOCH, H. C. Evaluation of wastes disposal problems in the pulp and paper industry. II. White paper mills. Sewage Ind. Wastes 22, no. 12: 1569-72 (December, 1950).

An evaluation is presented of the waste-disposal problems of the fine paper mills which receive their fibrous materials from outside sources. M.W.

LAWRANCE, WALTER A. The addition of sodium nitrate to the Androscoggin River. Sewage Ind. Wastes 22, no. 6: 820-32 (June, 1950); *cf.* B.I.P.C. 19: 120.

The addition of sodium nitrate to maintain an oxygen level has been found practical in preventing the formation of the hydrogen sulfide odor nuisance in the canal systems of the Androscoggin River between Lewiston and Auburn, Maine, which is caused by the discharge of sulfite waste liquor from upstream mills. Sodium nitrate is used to maintain an environment favorable to aerobic bacteria and to avoid the odors produced under anaerobic conditions by, in this instance, *Sporovibrio desulfuricans*. A total of 641.5 tons of sodium nitrate was added to the river during 44 days of the summer of 1949. The maximum hydrogen sulfide content in the canal water during this time was 0.01 p.p.m. The 1949 Androscoggin River program, which also included an adjustment of production by the sulfite mills, resulted in the most favorable odor conditions that have existed in the area for a decade. 7 tables, 6 figures, and 8 references. M.W.

LEBOSQUET, M., JR., and WEIBEL, S. W. Industrial wastes of the Ohio River Basin. Proc. 2d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 60: 97-107 (March, 1946).

In a study of the various industrial wastes which drain into the Ohio River and its tributaries, pulp and paper mill wastes are mentioned. Of 59 pulp, paper, and strawboard mills studied, at least minor corrective measures were evident in 46 of them. A wide diversity of measures were employed, and a few examples are presented. 2 tables. M.W.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 43, no. 1: 79-80A (January, 1951).

The author discusses the favorable results obtained by the addition of sodium nitrate to prevent a serious hydrogen sulfide odor nuisance of the

Androscoggin River during the hot summer months (*cf.* preceding abstract). However, it is emphasized that the pollution is merely abated and not corrected. The method is commendable as a step forward, but it is not the final answer in correcting stream pollution, because it alleviates the condition but does not restore the river to its natural state. 1 reference. M.W.

NORTHERN PAPER MILLS, *Green Bay, Wis.* Northern Paper Mills to build steam purification plant. Paper Ind. 32, no. 10: 1056-7 (January, 1951); Paper Trade J. 132, no. 1: 12, 20 (Jan. 5, 1951).

Northern Paper Mills has announced that it will construct at an estimated cost of $1,500,000, a plant to reduce sulfite pollution of the Fox River. The plant will use the evaporation and burning process to dispose of spent sulfite liquor, and indications are that the installation will enable Northern to reduce the pollutional effects by 40-45%. Construction will begin as soon as the plans are approved by state authorities, and the time limit, Dec. 31, 1951, will be met unless defense demands for stainless steel and other necessary materials make them unavailable for civilian usage. The evaporation and burning process is described. 1 flow diagram. M.W.

SAVAGE, R. H. Evaluation of wastes disposal problems in the pulp and paper industry. I. Pulp and paper mills. Sewage Ind. Wastes 22, no. 12: 1567-9 (December, 1950).

Some of the administrative, economic, and technical problems to be met in the initiation of a water pollution-control program of a paper mill are discussed briefly. M.W.

SUGARS

WISE, LOUIS E., RITTENHOUSE, RUTH C., and GARCIA, CONSUELO. Presence of galactose units in unbleached kraft pulps. Tappi 34, no. 1: 15 (January, 1951).

Two sulfate pulps prepared from western hemlock and Douglas-fir were hydrolyzed and examined for galactose by the methods of paper-partition chromatography. The two hydrolyzates gave clear chromatograms for galactose, xylose, and arabinose. The presence of galactose was further confirmed in the Douglas-fir pulp by oxidation to mucic acid by means of nitric acid. This appears to be the first time that the presence of galactose units has been shown unequivocally in any pulp. The results indicate that, in Douglas-fir and western hemlock, galactose units are present in traces in the hemicelluloses of the cell wall. The procedure involved heating with 0.1 *N* acid, which appeared to leave the glucose units unaffected. This indicates that differential pulp hydrolyses may be possible. 10 references. M.W.

SULFITE WASTE LIQUOR

SUNDMAN, JACOBUS, and SUNDMAN, VERONICA. The formation of aldehyde and alcohol yield during the fermentation of sulfite waste liquor. Paper and Timber (Finland) 32, no. 12: 379-83 (December, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 207.

This is the complete text of the article of which a brief account was given previously. 1 table, 9 figures, and 6 references. E.S.

SULFUR

PERRY, HENRY J. Our sulphur problem. Paper Trade J. 131, no. 24: 28-9 (Dec. 14, 1950).

The author discusses the reasons for shortages in the world supply of sulfur and possible means for their alleviation. 4 tables. E.S.

SURFACE PHENOMENA

HARRIS, B. L. Adsorption. Ind. Eng. Chem. 43, no. 1: 46-55 (January, 1951).

Contributions made during the past year to the field of adsorption are reviewed under the headings: surface-area studies, chromatography, liquid phase adsorption, preparation and properties of adsorbents, kinetics of adsorption, and individual studies of equilibrium data. 1 illustration and 315 references. M.W.

TALL OIL

MATHEWS, R. S. A review of the newer drying oils. Am. Ink Maker 29, no. 1: 27-30, 57 (January, 1951).

In a general discussion of new drying oils, the properties and possible uses of tall oil are mentioned. 4 tables. M.W.

TEXTILE INDUSTRY AND FABRICS

TURNER, H. A. Cellulose textile chemistry. Repts. Progress Applied Chem. 34: 524-61 (1949); *cf.* B.I.P.C. 20: 353.

The author reviews recent developments in the chemistry of cellulose fibers (natural and synthetic), preparatory processes, dyeing, textile printing, and finishing, chiefly during the years 1948 and 1949. 312 references. M.W.

VISCOSITY

MACCOULL, NEIL. Viscosity. Paper Trade J. 131, no. 25: 26-8; no. 26: 14, 16, 18-20 (Dec. 21, 28, 1950); 132, no. 1: 18, 20; no. 2: 18-19, 22-4, 26 (Jan. 5, 12, 1951).

The author has collected and amplified information on the subject of viscosity from articles published in *Lubrication* by the Texas Company. The first part of the article illustrates the simplest concept of streamline flow between two surfaces which have relative motion. A series of torsion viscometers is included to show how viscosity acts and may be measured in this type of fluid flow. The second part deals with streamline flow in capillary and other small tubes. Turbulent flow as it is encountered in pipes is discussed in the third part, and the effects of temperature and pressure on viscosity in the fourth; the fifth part covers the viscosity index. A very brief reference to the nature of plastic flow is given in Part VI. 3 tables and 31 figures. M.W.

WASTE

KEYES, JOSEPH F. Waste in pulp & paper mills. Paper Trade J. 131, no. 23: 20-2 (Dec. 7, 1950); Southern Pulp Paper Manuf. 14, no. 1: 40, 42 (January, 1951); Paper Mill News 74, no. 1: 18, 20 (Jan. 6, 1951).

The author deals with waste in the use of materials, machinery, methods, and men, with particular reference to operations in a sulfate mill. The key to waste reduction is education and supervision. E.S.

WOOD

FISCHER, EMIL. The European supply of pulpwood. Wochbl. Papierfabr. 78, no. 24: 735-6 (Dec. 31, 1950). [In German]

Statistical data for pulpwood consumption, exports, and imports in different European countries for the period 1938-1950 are given; possibilities for increasing the German pulpwood supplies are considered. 2 tables.
E.S.

WOOD—EXTRACTIVES

LINDSTEDT, GÖSTA. Constituents of pine heartwood. XXIII. Isolation of dihydropinosylvin monomethyl ether from the heartwood of *Pinus albicaulis* Engelm. Acta Chem. Scand. 4, no. 8: 1246-9 (1950); *cf.* B.I.P.C. 21: 278.

From the heartwood of *Pinus albicaulis* Engelm. the author isolated dihydropinosylvin monomethyl ether (3-hydroxy-5-methoxydibenzyl) by means of paper chromatography; this compound has also been prepared by catalytic hydrogenation of pinosylvin monomethyl ether. The new substance seems to be present in the heartwood of most pines of the group *Haploxylon*. 2 references.
E.S.

WOOD—PULP YIELD AND QUALITY

KEATON, H. L., and GILLESPIE, W. F. Effect of storage of southern pine on pulp yield and quality. Tappi 34, no. 1: 21-4 (January, 1951); Southern Pulp Paper Manuf. 14, no. 2: 46-8 (February, 1951).

Some operational and economic problems posed by wood storage in the South are discussed. Operational difficulties presented by wood storage are as follows: difficulties in handling easily removed bark, jamming conveyor sprockets and chains, excessive chipper fines, low yields, low tests, and changed black-liquor characteristics. A comparison of dry-inventory wood which showed marked signs of decay was made with freshly cut green southern pine to determine the effects of prolonged storage on chipping and pulping characteristics and pulp quality. A four-day mill run of 100% five-month-old, relatively dry inventory wood was made following the experimental cooks. The results found were in agreement with those from the experimental cooks, including more fines during chipping, lower specific gravity and pulp yields, a lower wood charge per digester, and lower strength properties of the resulting pulps from the decayed wood. 4 tables, 5 figures, and 2 references.
E.S.

WOOD TRANSPORTATION

HORNCASTLE, D. C. Hauling four-foot wood with self-loading sloop. Pulp Paper Mag. Can. 51, no. 13: 128, 130-1 (December, 1950).

The possibilities of a self-loading sloop, a mechanical device for prehauling wood from the stump to a transfer point or dump, in woods operations in Eastern Canada are discussed. The sloop can be used on soil types that will permit tractor operation as well as in snow; it can haul wood at less cost than conventional methods under certain conditions, and its efficiency is being steadily increased.
E.S.

X-RAY RESEARCH

TÖNNESEN, BJARNE ANDVORD. The structure of cellulose fibers. Paper and Timber (Finland) 32, no. 12: 367-78 (December, 1950). [In Norwegian; English summary]

The recent literature on some aspects of the morphological and physical

structure of cellulose fibers is reviewed, including light- and electron-microscopic studies and x-ray investigations. Reference is made to the author's application of Finbak's x-ray diffraction method for liquids (*cf.* Acta Chem. Scand. 3: 1279-308 [1949]) to the study of the molecular structure of cellulose chains in unoriented samples of regenerated cellulose (viscose); the work is still in progress. Two radial distribution functions are shown in curves which give an indication of the interatomic distances in the samples in the range below 15 A.; the possible correlation between these curves and the chain structure is pointed out. 28 figures and 36 references. E.S.

XYLAN

WHISTLER, ROY L. Xylan. Advances in Carbohydrate Chem. 5: 269-90 (1950).

The occurrence, isolation, removal of lignin, extraction, purification, composition and structure, oxidation, degree of polymerization, derivatives, biological decomposition, and industrial uses of xylan are reviewed. 2 tables, 4 figures, and 140 references. M.W.

YEAST

ANON. Purchase of the L. S. Yeast Corp. stock announced by Rhinelander Paper Co. Paper Ind. 32, no. 10: 1065 (January, 1951); *cf.* B.I.P.C. 18: 481; 19: 665.

Rhinelander Paper Co. has purchased all outstanding stock of the Lake States Yeast Corp.; the yeast plant's experimentation to develop ways for improving the condition of Wisconsin streams will continue in exactly the same direction. All technical information which may be developed in the future will be available to the Sulphite Pulp Manufacturers' Research League, just as before the sale; the staff scientists of the League will continue to give the yeast plant the benefit of their research findings. E.S.

PAVCEK, PAUL L. Technical achievements in the German feed and food yeast industry. Wallerstein Labs. Communs. 13, no. 43: 369-77 (December, 1950).

Of the several new methods for yeast production developed in Germany during the period 1935-1945, two have been incompletely described in T.I.I.C. reports and the literature. The author summarizes data collected on these processes at the I. G. Farbenindustrie's Bitterfeld and Wolfen semicommercial and pilot plants. Novel features described, which differ from the commercial Waldhof process (*cf.* B.I.P.C. 17: 101), are especially concerned with the Scholler-Seidel external aeration system, the modified Svenska Jäst Aktiebolaget fermentor system, and a novel, high-capacity yeast centrifuge (Schälschleuder). Mechanical defoaming features were employed in the two fermentor systems and were supplemented with sulfonated-oil, antifoam agents. The Schälschleuder combined defoaming action with a large capacity for yeast recovery in the form of slurry or cake with 20% solids. Brief descriptions of various yeast products and processes and a summary analysis of yeast grown on wood sugars are provided; the German work on sulfite waste liquor is also discussed. 3 tables, 10 figures, and 2 references. A.J.W.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

BLEACHING

RAPSON, WILLIAM H. Methods of bleaching wood pulp. Canadian patent 470,478. Filed March 2, 1949. Issued Jan. 2, 1951. 14 claims. Assigned to Canadian International Paper Company.

A process is described for the bleaching of chemical wood pulp to a high brightness without substantial degradation. As an example, a chlorinated and caustic-extracted sulfite pulp (12% consistency) is treated with 0.7% chlorine dioxide at 80°C. for 30 minutes. After washing, the pulp (6% consistency) is treated with 0.44% soda bleach and 0.25% sodium hydroxide at 60° for six hours. The pulp brightness is 97.4% and the viscosity 22.7 centipoises.

E.G.S.

BOARD

EVANS, RAYMOND N., and INGRASSIA, ANGELO P. Lignin-furfuryl alcohol resins and process of making same. U. S. patent 2,538,302. Filed June 3, 1946. Issued Jan. 16, 1951. 4 claims. Assigned to Masonite Corporation. [Cl. 260-17.4]

A process for the preparation of a water- and alkali-resistant fibrous product comprises the steps of heating an aqueous solution of furfuryl alcohol, lignin (up to 60%, based on the weight of alcohol), and an acid catalyst (e.g., phthalic acid, iodine, and boron trifluoride) to form a resinous material; heating the resinous material to reduce the volatile content; mixing the material with acid-hydrolyzed lignocellulose fiber (e.g., exploded wood chips); and subjecting the mixture to heat and pressure. E.G.S.

WILLEY, GRANT S. Digesting lignocellulose with a rosin soap. U. S. patent 2,538,742. Filed Feb. 14, 1944. Issued Jan. 16, 1951. 6 claims. Assigned to United States Gypsum Company. [Cl. 92-9; changed to 92-6]

A method of forming a high-strength, water-resistant hardboard with improved bending properties consists of digesting disintegrated natural lignocellulosic material (e.g., cottonwood or willow) at 335-385°F. for 0.5-1.5

hours in an aqueous suspension of a waterproofing sizing material (e.g., rosin size) to obtain a bonedry yield of 80-90% and to generate pyroligneous acids to precipitate the sizing material; removing a substantial portion of the spent cooking liquors; further disintegrating the lignocellulosic material into a fiber; forming a wet lap from an aqueous suspension of the fiber; and pressing the wet lap between heated platens until it has dried. E.G.S.

BOARD, BUILDING

CAMP, THOMAS P. Process for making wallboard. U. S. patent 2,537,509. Filed Dec. 20, 1944. Issued Jan. 9, 1951. 5 claims. Assigned to United States Gypsum Company. [Cl. 154-87]

A process is described for the manufacture of paper-lined gypsum wallboard. It is claimed that a board is formed which is free from protuberances on its back surface. 3 figures. E.G.S.

SMITH, WARREN R., and OTHMER, DONALD F. Process for manufacture of wallboard from lignocellulosic material. U. S. patent 2,537,101. Filed June 8, 1946. Issued Jan. 9, 1951. 3 claims. Smith's interest assigned to Donald F. Othmer, William R. White, Jr., and Louis Ricciordi. [Cl. 260-17.2]

A process for the manufacture of wallboard comprises the addition of 2.6-10% of an activating agent of the group consisting of phenol, cresol, xylenol, and mixtures thereof, to 3.3-10% of lignin, admixed with a natural lignocellulosic material such as wood waste (percentages based on the weight of lignocellulosic material); and the subjection of the resultant mixture to heat and pressure between platens at 178-300°C. and at least 150 p.s.i. E.G.S.

BOARD, INSULATING

JUSTSUK, EUGEN, and JUSTSUK, JOANN. Methods of producing insulating bodies. Canadian patent 470,796. Filed Feb. 13, 1950. Issued Jan. 16, 1951. 4 claims.

A molded insulating board, plate, or slab is produced by subjecting an aqueous suspension of relatively coarse particles (e.g., shavings, split chips, crushed straw, or bark) and a relatively finely divided fibrous material (e.g., waste paper, peat, or cellulose) to a centrifugal molding operation. E.G.S.

BOARD SPECIALTIES

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,537,614. Filed Aug. 30, 1947. Issued Jan. 9, 1951. 13 claims. Assigned to Morris Paper Mills. [Cl. 224-45]

A compartmented paperboard bottle carrier incorporates a multi-ply, central handle member. 8 figures. E.G.S.

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,537,615. Filed Jan. 11, 1949. Issued Jan. 9, 1951. 8 claims. Assigned to Morris Paper Mills. [Cl. 229-52]

A multicompartment paperboard bottle carrier incorporates integral flap elements in its end walls which are interleaved and adhesively attached to a central vertical panel; it is claimed that the rigidity and twist resistance of the central panel are distributed to the end walls. 18 figures. E.G.S.

BECKER, WALTER A., and CATO, CARL P. Single blank cloth board end cap. U. S. patent 2,537,617. Filed Aug. 26, 1947. Issued Jan. 9, 1951. 1 claim. Assigned to Old Dominion Box Company. [Cl. 229-16]

A foldable paperboard blank is adapted to be slipped over each end of a corrugated bolt board and is provided with a tongue which serves to prevent the end pieces from sliding off the ends of the bolt board. 10 figures. E.G.S.

CARSON, PERCY A. Packing containers. Canadian patent 470,342. Filed Nov. 6, 1946. Issued Dec. 26, 1950. 6 claims. Assigned to Canadian General Electric Company, Limited.

This is the same as U. S. patent 2,451,806; *cf.* B.I.P.C. 19: 287. E.G.S.

FORRER, HOMER W. Bottle carrier. U. S. patent 2,537,452. Filed June 26, 1948. Issued Jan. 9, 1951. 11 claims. Assigned to Atlanta Paper Company. [Cl. 229-52]

This corresponds to Canadian patent 466,498; *cf.* B.I.P.C. 20: 918. E.G.S.

GUYER, REYNOLDS. Poultry tray. U. S. patent 2,536,639. Filed Nov. 29, 1946. Issued Jan. 2, 1951. 8 claims. Assigned to Waldorf Paper Products Company. [Cl. 206-44]

A cardboard poultry tray is described which encloses the bottom and sides of a dressed bird and which includes a pair of end flaps between which the legs of the bird may extend. 4 figures. E.G.S.

HALL, MAYNARD G., and KOWAL, MICHAEL H. Bottle carrier. U. S. patent 2,539,304. Filed May 6, 1948. Issued Jan. 23, 1951. 5 claims. Assigned to Empire Box Corporation. [Cl. 229-28]

The end panels of a multicompartment cardboard bottle carrier project from opposite ends of the folded or collapsed carrier so as to simplify the erecting operation. 11 figures. E.G.S.

SCOBLE, WILLIAM H. Collapsible recessed display stand. U. S. patent 2,537,318. Filed July 22, 1949. Issued Jan. 9, 1951. 2 claims. Assigned to Einson-Freeman Co., Inc. [Cl. 211-135]

A cardboard merchandise-display table consists of a supporting structure formed of upstanding walls, and a table top which fits snugly within the upper part of the supporting structure. 9 figures. E.G.S.

WHALLEY, GEORGE E. Pallet. U. S. patent 2,536,587. Filed April 10, 1946. Issued Jan. 2, 1951. 1 claim. [Cl. 248-120]

A pallet which is adapted for use in the transfer, shipment, and storage of goods consists of a number of relatively flat, hollow sections; each section is formed by wrapping a sheet of phenolic resin-impregnated material (e.g., paper or cloth) around a temporary core and subsequently removing the core when the resinous material has been cured and set. 8 figures. E.G.S.

CALCIUM CARBONATE

SCHUR, MILTON O., and LEVY, ROBERT M. Method of manufacturing calcium carbonate. U. S. patent 2,538,802. Filed May 3, 1947. Issued Jan. 23, 1951. 4 claims. Assigned to Ecusta Paper Corporation. [Cl. 23-66]

A method is described for the preparation of a calcium carbonate filler for cigarette paper. The essential feature of the process is the precipitation of the calcium carbonate in the presence of a suspension of previously produced calcium carbonate of fine particle size. E.G.S.

CELLULOSE ETHERS

RUPERTI, ANDREAS. Processes for making alkali cellulose. Canadian patent 470,686. Filed June 22, 1944. Issued Jan. 9, 1951. 8 claims. Assigned to Ciba Limited.

This is the same as U. S. patent 2,447,914; *cf.* B.I.P.C. 19: 130-1. E.G.S.

CHLORINE DIOXIDE

ASTON, ROYDEN N. Repression of chlorine dioxide generation from acidified chlorite solutions. Canadian patent 470,725. Filed Nov. 25, 1947. Issued Jan. 9, 1951. 7 claims. Assigned to The Mathieson Alkali Works.

A method for the repression of chlorine dioxide generation in acid, aqueous solutions of chlorites includes the addition of synergistic proportions of hydrogen peroxide and a water-soluble pyrophosphate or polyphosphate (e.g., tetrasodium pyrophosphate, sodium tripolyphosphate, or sodium hexametaphosphate). The process is designed to eliminate the corrosion of metal tanks or vats in which acid chlorite solutions are handled. E.G.S.

HUTCHINSON, WILLIS S. Processes for generation of chlorine dioxide. Canadian patent 470,727. Filed Aug. 27, 1948. Issued Jan. 9, 1951. 6 claims. Assigned to Mathieson Chemical Corporation.

A cyclic process for the generation of chlorine dioxide comprises the steps of reacting nitrogen dioxide with sodium chlorite to form chlorine dioxide and sodium nitrite, recovering nitrogen dioxide from the nitrite by the addition of sulfuric acid, and reacting the liberated nitrogen dioxide with more sodium chlorite to generate additional chlorine dioxide. 1 figure. E.G.S.

COTTON HULL FIBER

ESKRIDGE, JEFFERSON L. Alkaline digestion of cottonseed hulls. U. S. patent 2,536,046. Filed July 17, 1945. Issued Jan. 2, 1951. 6 claims. [Cl. 92-13]

A process for obtaining α-cellulose from cottonseed hulls to which the hull fiber is rigidly attached includes the digestion of the premoistened hulls at 52-135 p.s.i. and 171°C. in a digesting solution which contains the following ingredients, expressed in pounds per ton of airdry hulls: 360 pounds of sodium hydroxide, 15 pounds of ammonium hydroxide (26° Bé.), 22.5 pounds of potassium carbonate, 7.5 pounds of ammonium oxalate, and 10,000 pounds of water. The digestion is continued for about three hours to dissolve the seed-coat component. E.G.S.

ESKRIDGE, JEFFERSON L. Producing alpha cellulose from cottonseed hull fibers. U. S. patent 2,536,045. Filed July 17, 1945. Issued Jan. 2, 1951. 12 claims. [Cl. 92-13]

A process is adapted for the recovery of α-cellulose from cottonseed hull fiber. Fibers which are substantially free from visible particles of cottonseed hull of appreciable size are digested for 1-3 hours at 160°C. and 109 p.s.i. in a cooking liquor having the following composition (based on the weight

of airdry hull fiber): 600.0% water, 10.0% caustic soda, 0.417% ammonium hydroxide (26° Bé.), 0.625% potassium carbonate, and 0.2085% ammonium oxalate. E.G.S.

DISPENSING CONTAINERS

BOILEAU, GUY. Dispensing containers for tissues. Canadian patent 470,433. Filed March 31, 1947. Issued Jan. 2, 1951. 4 claims.

A cardboard dispensing container for facial tissues is of a suitable size for carrying in a purse or handbag. 6 figures. E.G.S.

FILTERING SPECIALTIES

HUNTER, ROBERT H. Filter element. U. S. patent 2,537,897. Filed July 9, 1947. Issued Jan. 9, 1951. 8 claims. [Cl. 210-169]

A disposable filter cartridge is designed for use in a lubricating oil filter and consists essentially of a roll of plain and/or creped cellulose sheet stock similar to toilet paper or cleansing tissue. 5 figures. E.G.S.

HUNTER, ROBERT H., and KASPER, ELMER J. Filter unit. U. S. patent 2,537,898. Filed Nov. 5, 1948. Issued Jan. 9, 1951. 4 claims. Kasper's interest assigned to Hunter. [Cl. 210-169]

A replaceable cartridge-type filter unit for an oil filter incorporates primary and secondary annular filtering bodies which are formed of alternate layers of soft and creped cellulose sheets, wound continuously in the same manner as a roll of double-ply toilet paper. 1 figure. E.G.S.

RUSSELL, JOHN K. Filters. Canadian patent 470,901. Filed May 25, 1950. Issued Jan. 16, 1951. 8 claims. Assigned to Luber-Finer Incorporated.

The filter element for a lubricating oil filter consists of a perforated container within which are stacked a number of layers of filter paper; alternate layers are cut in such a manner that inlet and outlet channels are provided. 11 figures. E.G.S.

FOLDING BOXES

BERGSTEIN, SAMUEL. Overlapped-end box. U. S. patent 2,536,530. Filed Dec. 7, 1946. Issued Jan. 2, 1951. 10 claims. Assigned to Robert M. Bergstein and Frank D. Bergstein. [Cl. 229-31]

An overlapped-end paperboard box is provided with a positive locking means for the inturned flap. 12 figures. E.G.S.

BUTTERY, KENNETH T. Automatic setup box. U. S. patent 2,538,860. Filed Sept. 23, 1948. Issued Jan. 23, 1951. 7 claims. Assigned to Sutherland Paper Company. [Cl. 229-41]

A setup box is automatically erected by pressure on opposite ends of the collapsed carton; when the parts are moved to the erected position, a stable bottom is provided, and the walls are supported against racking stresses. 9 figures. E.G.S.

LEHMAN, LINCOLN D. Carton. U. S. patent 2,536,948. Filed Jan. 15, 1947. Issued Jan. 2, 1951. 2 claims. [Cl. 229-31]

A one-piece heat- and cold-insulating carton is provided with a closure lid which incorporates means for bracing the carton when the lid is closed. 7 figures. E.G.S.

MELLER, REGINALD B. Glueless interlock for double walled folding boxes. U. S. patent 2,536,384. Filed April 17, 1948. Issued Jan. 2, 1951. 21 claims. Assigned to Bemiss-Jason Company. [Cl. 229-35]

A glueless interlock for multiwall folding boxes is permanent and can not, except by the use of special tools, be separated or disengaged. 9 figures. E.G.S.

MIRES, JOSEPH E. Carton for packaging radio tubes and like articles. U. S. patent 2,537,151. Filed Sept. 12, 1946. Issued Jan. 9, 1951. 1 claim. Assigned to Somerville Limited. [Cl. 229-39]

This corresponds to Canadian patent 446,655; *cf.* B.I.P.C. 18: 485. E.G.S.

SCHWARTZBERG, LOUIS. Egg carton. U. S. patent 2,537,374. Filed Feb. 3, 1947. Issued Jan. 9, 1951. 2 claims. [Cl. 229-29]

The inner plies of the central partition of a cellular paperboard egg carton are cut out or apertured to form shock-absorbing cushion areas between the eggs on either side of the partition. 5 figures. E.G.S.

WILLIAMSON, MARSHALL I. Folding box. U. S. patent 2,536,990. Filed Jan. 29, 1948. Issued Jan. 2, 1951. 8 claims. Assigned to National Folding Box Company, Inc. [Cl. 229-16; changed to 229-37]

A folding display box is provided with an integral main panel or platform for the support of merchandise which is to be elevated above the surface on which the box rests. 13 figures. E.G.S.

MACHINERY—CALENDERS

DENNISON, ROBERT C. Machine for pressing sheet material. U. S. patent 2,538,086. Filed Feb. 5, 1947. Issued Jan. 16, 1951. 3 claims. [Cl. 92-71]

A machine is adapted for the calendering of paperboard. The first and second roller couples of the unit constitute a glazing or calendering set; the first couple serves to compress and glaze the paperboard along zones or stripes but leaves intervening zones or stripes unglazed. The second couple acts similarly but serves to compress and glaze the areas which were missed by the first couple. The rollers of a second set of couples bear the same complementary relation to one another, but their collars are offset somewhat with relation to the collars of the first pair. 4 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

AQUILLA, JOHN. Machine for producing display cards. U. S. patent 2,537,874. Filed Dec. 18, 1946. Issued Jan. 9, 1951. 7 claims. [Cl. 154-35; changed to 154-1.8]

A machine is adapted for use in the manufacture of tissue-covered jewelry display cards. Means are provided for affixing tissue paper to a continuous strip of cardboard and for maintaining the tissue on the cardboard with a predetermined degree of looseness. 5 figures. E.G.S.

BERGSTEIN, SAMUEL. Method and means of making bags. U. S. patent 2,536,675. Filed May 7, 1945. Issued Jan. 2, 1951. 3 claims. Assigned to Robert M. Bergstein and Frank D. Bergstein. [Cl. 93-18]

Means are provided for the uniform application of a thermoplastic adhesive around the inner surface of the mouth of a heat-sealing paper bag or tube. 3 figures. E.G.S.

BERGSTEIN, SAMUEL. Method of producing bags with opening means. U. S. patent 2,536,529. Filed Aug. 9, 1944. Issued Jan. 2, 1951. 4 claims. Assigned to Robert M. Bergstein and Frank D. Bergstein. [Cl. 93-35]

A bag machine is adapted for the manufacture of laminated bags or carton liners (e.g., made of Pliofilm laminated to paper). Means are included for forming a predetermined line of weakening in the walls of a bag or liner and then coating the weakened line, including a contiguous area of the walls, with a film-forming substance which is capable of filling or closing the perforations in the line. In this manner the proofness of the bag walls is preserved in spite of the line of weakening. 14 figures. E.G.S.

HUNZICKER, DEAN L., and WALTON, CLIFFORD T. Apparatus for slitting and expanding sheet material. U. S. patent 2,537,764. Filed Aug. 21, 1946. Issued Jan. 9, 1951. 17 claims. Assigned to Research Products Corporation. [Cl. 93-1]

An apparatus is designed for the slitting and expanding of thin, flexible sheet material (e.g., paper, cloth, metal foil, or the like) which, after having been slit, is adapted to be expanded by a stretching operation. 7 figures. E.G.S.

MACHINERY—CORRUGATING MACHINE

JACOBSEN, PETER. Methods in the production of corrugated cardboard and machines for carrying out the methods. Canadian patent 470,491. Filed Aug. 23, 1947. Issued Jan. 2, 1951. 12 claims. Assigned to Dry Corrugating Method v/Akselbo, Berbom og Drostholm.

This is the same as U. S. patent 2,505,404; *cf.* B.I.P.C. 20: 684. E.G.S.

SIDEBOTHAM, MELVIN H. Apparatus for making fluted containers. U. S. patent 2,539,356. Filed Dec. 11, 1947. Issued Jan. 23, 1951. 2 claims. [Cl. 154-31; changed to 154-30]

A corrugating machine is adapted for the high-speed production of a continuous series of transversely positioned, fluted units from two paper webs. The fluted material is used in the packaging of small products. 9 figures. E.G.S.

MACHINERY—DRYERS

CHAPLIN, MERLE P. Apparatus for operating molded fibre drying dies. Canadian patent 470,687. Filed Sept. 10, 1949. Issued Jan. 9, 1951. 7 claims. Assigned to Chaplin Corporation.

A machine for the drying of molded-pulp articles incorporates a cam track to maintain a pair of mated drying dies in compressive contact with the pulp

article during the major portion of the rotary cycle of the drying unit, and to control the pressure applied to the article during this period. 5 figures.
E.G.S.

MACHINERY—FELT CONDITIONERS

VICKERY, FREDERICK W. Felt conditioners for use in papermaking. Canadian patent 470,239. Filed Nov. 8, 1948. Issued Dec. 19, 1950. 7 claims. Assigned to Vickerys Limited.

A felt-conditioner shoe incorporates jets for supplying cleaning fluid to the felt; the jets are alternated with vacuum holes, so that the felt is subjected to rapidly alternating cleaning cycles, each of which involves an injection of cleaning fluid into the felt and a subsequent vacuum extraction of cleaning fluid from the felt. 13 figures. E.G.S.

MACHINERY—GRINDERS

SANDWELL, PERCY R. Antisurge valve for hydraulic wood grinders. U. S. patent 2,538,383. Filed Sept. 23, 1948. Issued Jan. 16, 1951. 5 claims. [Cl. 121-46.5]

An antisurge valve is designed to be used in conjunction with a hydraulically operated and controlled pulpwood grinder for eliminating shock-loading effects on the pulpstones whenever a new charge of wood is just brought into grinding contact with the stones by a presser foot. The control valve assembly is interposed between a governor and a grinder pocket and is adapted normally to permit the free passage of high-pressure water from the governor during the grinding phase and to cut off the flow of high-pressure water during the latter part of the feed stroke of the presser foot in the grinder pocket, while simultaneously permitting the flow of low-pressure water from a separate source to complete the feed stroke of the presser foot. 4 figures. E.G.S.

MACHINERY—HEAD BOX

LOCKYER, DONALD A., and KILLIN, ANDREW E. Stock distributing devices for papermaking machines. Canadian patent 470,148. Filed May 18, 1949. Issued Dec. 19, 1950. 8 claims. Assigned to Bowater's Newfoundland Pulp & Paper Mills Ltd.

A stock-distributing device is described which will deliver pulp to the wire of a paper machine uniformly and without turbulence. The headbox consists of a reservoir or pond for the pulp, which communicates directly with the slice or opening leading onto the wire. The size of the pond is kept to a minimum to avoid undue flocculation in the pond. In order to achieve proper circulation of the stock within the pond, baffles and other devices may be incorporated. Previously processed stock is delivered to the pond through a nozzlelike attachment which is secured to the end of the stock-delivery pipe; thus a gradual decrease in the velocity of the stock is permitted, and the stock is caused to flow uniformly over a large area. From the discharge orifice of the nozzle the stock flows over a weir of considerable thickness which extends the entire width of the machine. The top of the weir slopes downward gently toward the pond from its point of contact with one of the diverging walls of the nozzle; thus a gentle entry of the stock into the pond is permitted. 4 figures. E.G.S.

LOWE, ALLEN A. Paper making apparatus. Canadian patent 470,575. Filed Sept. 8, 1948. Issued Jan. 2, 1951. 5 claims. Assigned to The Sandy Hill Iron & Brass Works.

According to this invention, papermaking stock is supplied under pressure to the Fourdrinier wire in such a manner as to provide a flow which is properly related to the speed of the wire. In this way, as the speed of the wire and the character of the formed web are varied, the delivery may be varied. In order that the stock delivery may be uniform under all conditions of operation, an excess of stock is provided so that more or less stock is recirculated, depending upon various operating variables. 2 figures. E.G.S.

LOWE, ALLEN A. Paper making apparatus. Canadian patent 470,576. Filed Sept. 8, 1948. Issued Jan. 2, 1951. 3 claims. Assigned to The Sandy Hill Iron & Brass Works.

According to this invention, a predetermined volume of stock passes through the headbox at a predetermined rate of flow. The volume of stock required for a given papermaking operation is caused to pass beneath the slice onto the wire, and the excess is recirculated so that uniformity of flow is assured. 2 figures. E.G.S.

LOWE, ALLEN A. Paper making apparatus. Canadian patent 470,577. Filed Sept. 8, 1948. Issued Jan. 2, 1951. 3 claims. Assigned to The Sandy Hill Iron & Brass Works.

A flowbox construction includes a number of separate sections which are arranged in such a manner that an inlet and several interconnected discharge orifices are provided; it is claimed that this arrangement affords a uniform flow of stock across the width of the box. 5 figures. E.G.S.

MACHINERY—REFINERS

VINCENT, HENRI L. X. Apparatus for refining fibrous materials. U. S.. patent 2,536,332. Filed Oct. 20, 1947. Issued Jan. 2, 1951. 1 claim. [Cl. 92-26]

A pulp refiner comprises a rotary, cylindrical, supporting, and refining surface for the pulp, as well as a number of grooved rollers; the grooves are substantially perpendicular to the axis of rotation. The rollers are positively held at a fixed distance from each other. During the refining operation the pulp is passed successively between the roughened (e.g., coated with wood, lava, etc.) inner surface of the rotating cylinder and each of the rollers. 3 figures. E.G.S.

MACHINERY—ROLL BREAKER

HOLMBERG, JOHN A. Paper roll breaker. U. S. patent 2,537,464. Filed Aug. 31, 1948. Issued Jan. 9, 1951. 10 claims. Assigned to Crown Zellerbach Corporation. [Cl. 164-84.5]

A machine is provided for breaking apart and separating small, individual rolls of paper (e.g., toilet paper) after they have been cut from longer rolls. 8 figures. E.G.S.

MACHINERY—SCREENS

CRAM, HERVEY G. Disc pulp screens. Canadian patent 470,486. Filed June 20, 1949. Issued Jan. 2, 1951. 4 claims. Assigned to Combined Locks Paper Co.

This is the same as U. S. patent 2,480,119; *cf.* B.I.P.C. 20: 60. E.G.S.

LINDBLAD, KARL R. Screening drum for dewatering suspensions. U. S. patent 2,537,414. Filed Feb. 4, 1946. Issued Jan. 9, 1951. 5 claims. Assigned to Svenska Cellulosa Aktiebolaget. [Cl. 92-42]

A screening drum for the dewatering or drainage of pulp suspensions consists of an outer shell provided with screen openings and an inner shell without such openings. Longitudinal partitions divide the space between the shells into cells which communicate with the interior of the drum through a discharge duct which is recurved in the direction of rotation and has a square or rectangular cross section. 3 figures. E.G.S.

MACHINERY—SHOWERS

LARSON, OSCAR E. Shower assembly for papermaking machines. U. S. patent 2,536,946. Filed Nov. 21, 1945. Issued Jan. 2, 1951. 2 claims. Assigned to John W. Bolton & Sons, Inc. [Cl. 299-59]

A device is adapted for the cleaning of a shower pipe which has an inlet pipe at one end, aligned spray nozzles of any one of the various kinds, and an outlet pipe. A flushing valve is turned by an operating rod which also carries a number of nozzle-cleaning members. 12 figures. E.G.S.

MACHINERY—SUCTION BOXES

JENNINGS, IRVING C. Suction box for traveling screen filters. U. S. patent 2,536,446. Filed Feb. 2, 1946. Issued Jan. 2, 1951. 10 claims. [Cl. 92-51; changed to 210-197]

A suction box for a Fourdrinier machine is equipped with small-diameter rollers and is provided with means for supporting the rollers at frequent intervals to prevent their deflection. 12 figures. E.G.S.

MACHINERY—TRANSFER ROLLS

GOODWILLIE, JOHN E. Structure for web transfers. U. S. patent 2,537,129. Filed Oct. 5, 1945. Issued Jan. 9, 1951. 4 claims. Assigned to Beloit Iron Works. [Cl. 92-49]

A paper machine is provided with a suction transfer roll for transferring a moist paper web from a pickup felt to a drier felt without the direct application of roll pressure to the felt at the point of transfer. 4 figures. E.G.S.

MACHINERY—VATS

BREYFOGLE, ROY H., and HOLLIS, ROBERT F. Cylinder type paper machines. Canadian patent 470,794. Filed Nov. 24, 1947. Issued Jan. 16, 1951. 14 claims.

In order to effect a seal between the ends of a cylinder mold and the side walls of the vat, a resilient annular seal is provided which projects axially from each end of the mold and bears endwise against a wearing ring mounted on each side wall. 9 figures. E.G.S.

NITRIC ACID PROCESS

MAINGUET, HENRI. Nitric acid digestion of straw. U. S. patent 2,539,093. Filed Jan. 6, 1945. Issued Jan. 23, 1951. 3 claims. [Cl. 92-9]

This is substantially the same as Canadian patent 454,923 (*cf.* B.I.P.C. 19: 600), with the exception that the U. S. patent is limited to the digestion of straw. E.G.S.

PAPER—COATED

BARRETT, GERALD R. Coating compositions. U. S. patent 2,537,017. Filed May 29, 1948. Issued Jan. 9, 1951. 14 claims. Assigned to Monsanto Chemical Company. [Cl. 260-45.2]

A coating composition for flexible base materials (e.g., fabrics, paper, impregnated paper, and the like) comprises polyvinyl butyral and a copolymer consisting of the copolymerization product of styrene and a methylamylcarbinyl, methylhexylcarbinyl, or methylisobutylcarbinyl half ester of maleic acid. E.G.S.

BARRETT, GERALD R. Coating compositions. U. S. patent 2,537,019. Filed May 29, 1948. Issued Jan. 9, 1951. 12 claims. Assigned to Monsanto Chemical Company. [Cl. 260-45.2]

A coating composition for flexible and nonflexible materials (e.g., metals, plastics, wood, fabrics, paper, and the like) comprises about 5-28% of a methylisobutylcarbinyl acid maleate-styrene copolymer (copolymerized in a ratio of 1:1 to 1:2), 0.2-4.0% by weight of a methylated melamine-formaldehyde resin, and a suitable solvent. E.G.S.

MOREY, LEON P. Methods and apparatus for changing coating solutions of coating machines. Canadian patent 470,350. Filed June 13, 1946. Issued Dec. 26, 1950. 16 claims. Assigned to Canadian Kodak Company, Ltd.

An arrangement is provided for changing coating solutions, wherein the various coating pans are movable between a coating position and a ready position; two pans can be interchanged rapidly and simultaneously by merely pushing a switch button. 5 figures. E.G.S.

SCHOENHOLZ, DANIEL, and TERRY, HERBERT. Coating compositions. U. S. patent 2,536,018. Filed June 16, 1948. Issued Jan. 2, 1951. 7 claims. [Cl. 260-28.5; changed to 117-38]

A composition is particularly adapted for the coating of paper book covers. As an example, the coating substance consists of the following: polyvinyl acetate dispersion (35%), 78.46%; ammonia (28%, 26° Bé.), 1.0%; Neutronyx 228 (the oleic acid condensate of polyethylene oxide, 25% aqueous dispersion), 0.62%; Aerosol OT (di-*n*-octyl sodium sulfosuccinate, 25% aqueous dispersion), 0.62%; dibutyl phthalate, 0.3%; and an alkaline wax dispersion, 19.0%. E.G.S.

SZWARC, ALEXANDER. Manufacture of coated water-vaporproof paper and coating compositions. U. S. patent 2,538,397. Filed March 6, 1948. Issued Jan. 16, 1951. 2 claims. [Cl. 260-17]

A water-vaporproofing composition for the coating of paper consists of 55-65% of a polymerized coumarone-indene resin; 8-12% of ethylcellulose; 10-20% of a rosin plasticizer selected from the group consisting of the methyl ester and hydrogenated methyl ester of rosin; 3-6% of a polymer of isobutene plasticizer obtained by the low-temperature polymerization of isobutene, using a fluoride as a catalyst; 8-14% of a paraffin wax which melts at 122-150°F.; and 1-3% of zinc stearate. E.G.S.

YOUNG, ARTHUR E., and STILBERT, ELMER K. Pigment coated paper. U. S. patent 2,537,114. Filed Feb. 26, 1948. Issued Jan. 9, 1951. 9 claims. Assigned to The Dow Chemical Company. [Cl. 117-155]

A printing paper is coated with a mixture of 8-30 parts of adhesive material and 100 parts of clay; the adhesive material consists of soybean protein and 0.333-3 parts of a butadiene-styrene copolymer (40:60) per part of protein. E.G.S.

PAPER—COATED (WRINKLE COATING)

FLANAGAN, WILLIAM F. Coating composition. U. S. patent 2,536,049. Filed Aug. 20, 1948. Issued Jan. 2, 1951. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 260-31.2; changed to 260-31.8]

A wrinkle-coating composition comprises (by weight) 150 parts of a vinyl chloride acetate copolymer, 100 parts of butyl acetate, 100 parts of methyl ethyl ketone, and 125 parts of cyclohexanone. E.G.S.

FLANAGAN, WILLIAM F. Method of producing a smooth-wrinkle patterned film. U. S. patent 2,536,048. Filed April 12, 1947. Issued Jan. 2, 1951. 11 claims. Assigned to New Wrinkle, Inc. [Cl. 18-57]

A predetermined pattern of wrinkle-textured and smooth areas is produced on a plastic film in accordance with the following process: A support which is capable of causing differential heating is coated with a composition consisting of 150 grams of a vinyl chloride acetate copolymer (87% vinyl chloride, 13% vinyl acetate), 100 grams of butyl acetate, 100 grams of methyl ethyl ketone, 125 grams of cyclohexanone, and 25 grams of diethylhexyl phthalate; the coating is subjected to infrared heat at 140°F. for four minutes; the coated support is immersed in a mixture of 90% water and 10% sodium sulfate of 3,9-diethyltridecanol-6 (as a wetting agent) for approximately three minutes; the coating is rinsed with water until the wetting agent has been completely removed; the coating is heated for 0.5 hour to 120° and thereafter to approximately 220° until the solvents are completely volatilized; and the resultant film is peeled from the support. 6 figures. E.G.S.

PAPER AS A TEXTILE MATERIAL

PETROSKE, JOHN J. Method of waterproofing paper textile fabrics. U. S. patent 2,536,656. Filed July 13, 1945. Issued Jan. 2, 1951. 3 claims. Assigned to Patchogue-Plymouth Mills Corporation. [Cl. 117-68]

A method of treating a textile fabric woven from variously colored threads of paper fiber consists in brush coating the entire surface of one side of the fabric with an aqueous composition which comprises aluminum acetate in a wax emulsion; pressing and simultaneously thoroughly drying the fabric in the presence of heat before the composition completely impregnates the fabric; spray coating lacquer over the entire surface of the untreated side of the thoroughly dried fabric; and allowing the lacquered surface to dry. 4 figures. E.G.S.

PAPER SPECIALTIES

BAKER, JAMES A., and HUNTER, FRANK A., JR. Ham packaging bag. U. S. patent 2,536,834. Filed Nov. 3, 1947. Issued Jan. 2, 1951. 3 claims. [Cl. 229-55]

A trapezoidal three-ply wrapper for the packaging of hams consists of an inner layer of grease-resistant stock, an intermediate layer of heavier moisture-absorbent stock (e.g., light cardboard), and an outer layer of durable, colored, printed stock. 7 figures. E.G.S.

BRANDES, GUENTHER C. F. Stiff paper basket. U. S. patent 2,536,590. Filed Dec. 28, 1946. Issued Jan. 2, 1951. 4 claims. [Cl. 229-3.5]

The construction of a frameless paper wicker basket includes the steps of forming the body of the basket on a mandrel, adding stiffening end hoops, and assemblying the parts by stitching or stapling; utilizing a paper border in assembling the basket into final structural form; and then dipping in the sizing so as to contract the paper wicker around the stiff end hoops. 6 figures. E.G.S.

CHILD, CHESTER H. Method of making moisture-resistant paper. U. S. patent 2,539,183. Filed Nov. 29, 1944. Issued Jan. 23, 1951. 5 claims. [Cl. 92-21]

A method of making a moisture-resistant paper includes the steps of adding to the papermaking stock prior to web formation about 2% of rosin and 3% of a microcrystalline paraffin wax (based on the dry weight of the pulp) which has a melting point of 122-165°F. and is in the form of an acid-unstable, aqueous emulsion; precipitating the wax and rosin on the pulp fibers by acidifying the stock with alum; bonding the precipitated wax to the fibers with about 3% of a water-soluble, curable, urea-formaldehyde resin (based on the dry weight of the pulp); forming the stock into a paper web; and curing the resin. The product is characterized by reduced water absorbency, low slippage, and high flexibility; it is adapted for use as an insulating tape in the manufacture of nonmetallic-sheath cable and backings for finishing papers. E.G.S.

GEIMER, WILLIAM J., and LINDA, FRANK R. Methods of closing bag tube ends. Canadian patent 470,147. Filed July 11, 1945. Issued Dec. 19, 1950. 10 claims. Assigned to Bemis Bro. Bag Co.

A method for closing the open tops of flat-type paper bags consists in intucking the upper corners of the flattened bag top between the opposed walls of the top to provide a pair of oppositely extending wings at each corner of the bag top; folding the wings and adhering them to the side walls of the bag top; folding a strip of tape over the flattened walls and the upper ends of the wings; and adhering the tape to the walls and wings to provide a leakproof closure. 9 figures. E.G.S.

HASLACHER, ALFRED B. Method of making automatic bottom bags. U. S. patent 2,537,462. Filed Nov. 16, 1944. Issued Jan. 9, 1951. 9 claims. [Cl. 93-35]

The mouth structure for a two-ply gusseted paper bag incorporates an inner ply of heat-fusible material; the inner ply may be sealed in any desired manner, and the outer ply may be formed into a closure. 20 figures. E.G.S.

ODÉN, GÖSTA K. Bag closure. U. S. patent 2,538,585. Filed Feb. 26, 1948. Issued Jan. 16, 1951. 3 claims. [Cl. 229-62]

The open end of a paper bag is slit and folded in such a manner that it can be folded shut and its folded portions interlocked to prevent the sifting of granular material. 3 figures. E.G.S.

OLSON, JOHN W. Method of making multiconductor cables. U. S. patent 2,536,885. Filed April 21, 1948. Issued Jan. 2, 1951. 7 claims. Assigned to Anaconda Wire and Cable Company. [Cl. 154-2.28; changed to 154-2.24]

The wires of a multiconductor electric cable are enclosed in a sheath which consists of a paper wrapping precoated with a thermoplastic material (e.g.,

a bituminous composition which has an A.S.T.M. ring-and-ball softening point above 125°F. and which is nonflowing at room temperature), and an overlying braided cotton jacket which is impregnated with a similar thermoplastic composition having a higher softening point. 1 figure. E.G.S.

STEWART, JAMES A. Reenforced containers. Canadian patent 470,660. Filed May 6, 1948. Issued Jan. 9, 1951. 14 claims. Assigned to American Can Company.

A rectangular paper milk container incorporates a reinforced, shock-resistant, end-seam construction which is adapted to prevent the leakage of liquid from the container. 7 figures. E.G.S.

SUGARMAN, NATHAN, and FRYMAN, FOSTER M. Coating composition and method of using same. U. S. patent 2,536,107. Filed Jan. 16, 1947. Issued Jan. 2, 1951. 14 claims. Assigned to The Standard Register Company. [Cl. 117-62]

A quick-setting composition for the coating of carbon paper consists of the following: heat-polymerized furfural, 20 parts; tetrahydrafurfural phthalate, 12 parts; Victor Chemical Works emulsifier no. 87 (an organic phosphorus derivative containing long-chain alkyl groups as well as water-solubilizing groups), 1 part; low-viscosity ethylcellulose, 1 part; Rezyl no. 12 (an alkyd resin made with nondrying oils and containing approximately 49% phthalic anhydride), 4 parts; and 2,4-diaminotoluene, 5 parts (all parts by weight). E.G.S.

PLASTICS—FILLERS

ESKRIDGE, JEFFERSON L. Alkaline digestion of cottonseed hull bran. U. S. patent 2,536,047. Filed July 27, 1945. Issued Jan. 2, 1951. 7 claims. [Cl. 92-13]

A process of making a plastic filler from cottonseed hull bran from which substantially all cotton fuzz has been removed comprises the digestion of the bran in an alkaline cooking liquor at 300-350°F. in a closed digester until about 20% of the hull bran constitutents are dissolved. The liquor initially contains 1 ton of cottonseed hull bran, 10 tons of water, 100 pounds of caustic soda, 4.17 pounds of ammonia water (calculated as 26° Bé.), 6.25 pounds of potassium carbonate, and 2.08 pounds of ammonium oxalate. E.G.S.

RESIN, SYNTHETIC

MCELHINNEY, THOMAS R. Synthetic resins from phenols and lignocellulosic materials. Canadian patent 470,237. Filed Dec. 11, 1945. Issued Dec. 19, 1950. 5 claims. Assigned to Valite Corporation.

A process of making a synthetic novolac-type resin which is similar to phenol-aldehyde resins comprises the steps of reacting phenol with a lignocellulosic material (e.g., bagasse, cornstalks, straw, wood, and the like) in the presence of 5% of concentrated sulfuric acid (based on the weight of the lignocellulosic substance) and live steam at 225 p.s.i. for about 30 minutes, and washing and drying the resulting product. E.G.S.

SHIPPING CONTAINERS

GUYER, REYNOLDS. Container. U. S. patent 2,536,442. Filed Jan. 27, 1949. Issued Jan. 2, 1951. 3 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-23]

A paperboard storage-battery container is provided with an open bottom so that the battery can not be picked up by engagement of the walls of the container alone. The container is designed in such a manner that most of the pressure upon the top of the container is exerted against the marginal edge of the battery within the container. 6 figures. E.G.S.

SUTHERLAND, DANIEL M. Method of making waterproof fibrous containers. U. S. patent 2,538,926. Filed March 25, 1946. Issued Jan. 23, 1951. 2 claims. [Cl. 92-21; changed to 18-47.5]

An aqueous suspension of wet powdered gilsonite is incorporated in a pulp stock for use in the manufacture of waterproof corrugated or solid fiber containers. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

DOYLE, JAMES F. Bag closure. U. S. patent 2,538,510. Filed Jan. 4, 1945. Issued Jan. 16, 1951. 4 claims. Assigned to Arkell Safety Bag Company. [Cl. 229-62]

A sewed seam-type closure for multiwall paper bags is constructed in such a manner as to prevent the occurrence of sifting through the needle holes. The needle holes and the crevices between the end of the bag tube and the sealing strip are sealed by dipping the closure in melted wax. 6 figures. E.G.S.

SHIPPING CONTAINERS—TESTING

SEARS, GEORGE R., RAE, ROBERT D., and VAN DEN AKKER, JOHANNES A. Testing apparatus. Canadian patent 470,189. Filed July 28, 1948. Issued Dec. 19, 1950. 4 claims. Assigned to The Institute of Paper Chemistry.

This is the same as U. S. patent 2,498,844; *cf.* B.I.P.C. 20: 621. E.G.S.

SULFITE WASTE LIQUOR

FRIES, KARL W. Processes of producing lactic acid. Canadian patent 470,211. Filed Jan. 25, 1946. Issued Dec. 19, 1950. 3 claims. Assigned to Rhinelander Paper Company.

A method of producing lactic acid from sulfite waste liquor comprises the steps of adding sufficient lime to the liquor to adjust the pH to 8.0-8.8, thereby precipitating free and loosely combined sulfur dioxide as calcium sulfite; allowing the lime-treated mass to stand for not more than 1.5 hours at a temperature above 35°C.; separating the resulting precipitate from the liquor; adjusting the liquor to a temperature between 30 and 40°, and to a pH between 6.3 and 6.7; adding to the liquor an inoculum of *Lactobacillus pentosus* 124-2 and a suitable nutrient; maintaining the inoculated liquor within the stated temperature and pH limits until a substantial conversion of the contained sugars to lactic acid has occurred; and recovering the lactic acid which is produced. E.G.S.

TALL OIL

DEVANEY, FRED D. Froth flotation of oxide iron ores. Canadian patent 470,701. Filed Nov. 17, 1948. Issued Jan. 9, 1951. 5 claims. Assigned to Erie Mining Company.

This is the same as U. S. patent 2,470,150; *cf.* B.I.P.C. 19: 749. E.G.S.

KOONCE, SAMUEL D., and PERRY, EDMOND S. Method of separating fatty acids from rosin acids of tall oil. U. S. patent 2,538,103.

Filed Nov. 9, 1946. Issued Jan. 16, 1951. 7 claims. Assigned to Eastman Kodak Company. [Cl. 260-97.6]

A process for the treatment of tall oil includes the conversion of the rosin acids to high-melting, solid rosin acid adducts, while leaving a fatty acid fraction as such. The conversion is effected by admixing the tall oil with maleic anhydride and condensing the rosin acids present in the tall oil at 150-210°C. A substantial amount of the adducts is precipitated and removed, and the fatty acid fraction is subsequently separated by distillation. E.G.S.

MOYER, SAMUEL P. Beneficiation of metallic oxide ores. Canadian patent 470,138. Filed Feb. 23, 1946. Issued Dec. 19, 1950. 6 claims. Assigned to American Cyanamid Company.

Tall oil is employed as a promoter in the separation of phosphorus-bearing ores (e.g., apatite) from metallic oxide ores (e.g., ilmenite, rutile, magnetite, hematite, and the like) by froth flotation. 1 figure. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

FORDEMWALT, FREDERICK. Oil-in-water type emulsion for flameproofing fabrics. U. S. patent 2,536,978. Filed Dec. 7, 1949. Issued Jan. 2, 1951. 8 claims. Assigned to American Cyanamid Company. [Cl. 260-15]

A method is described for the production of a stable, heterogeneous, oil-in-water-type emulsion which is adapted for the simultaneous deposition on fabrics of fire-resisting, coloring, and binding materials. The process comprises the steps of preparing an aqueous medium by dissolving therein 0.1-10% of a hydrophilic colloid (e.g., a water-soluble methylcellulose), 0.25-4.0% of an ammonium soap of a higher fatty acid, and sufficient alkaline material to maintain an alkaline pH; blending into a smooth paste a mixture comprising sufficient film-forming, substantially colorless, fire-resistant, water-insoluble, nonvolatile, chlorinated organic compound to provide 2-12% of combined chlorine capable of liberating hydrogen chloride at elevated temperatures, 5-30% of a colorless, fire-retarding pigment, and only a sufficient amount of a hydrocarbon solvent to impart fluidity; blending at least one coloring pigment into a smooth paste with a solvent solution of 0.5-10% of an uncured, heat-convertible binder resin, selected from the group consisting of the drying oil-modified alkyd resins, the hydrocarbon solvent-soluble, amide-aldehyde resins, and mixtures thereof; and separately dispersing the pasted materials into the aqueous medium. All compositions are given as weight percentages of the total emulsion. E.G.S.

VARTANIAN, RICHARD D. Flame resistant and mildew resistant composition for cellulose fibers and fabrics. U. S. patent 2,536,988. Filed Dec. 7, 1949. Issued Jan. 2, 1951. 10 claims. Assigned to American Cyanamid Company. [Cl. 260-15]

A stable, heterogeneous, oil-in-water-type emulsion is adapted for the simultaneous deposition on fabrics of mildewproofing, fire-resisting, afterglow-preventing, coloring, and binding materials from an aqueous medium. The composition consists of a continuous, aqueous dispersion medium which contains 0.1-10% by weight of a hydrophilic colloid (e.g., methylcellulose) and 1-5% of a water-soluble phosphate afterglow preventative; a dispersed phase which comprises 5-30% of a film-forming, substantially colorless, water-insoluble, nonvolatile, chlorinated organic compound containing 2-12% (by weight of the emulsion) of combined chlorine, capable of liberating hydrogen chloride at elevated temperatures, 6-15% of a colorless, fire-

retarding pigment, and an organic solvent; a separately dispersed phase which comprises an organic solvent, at least one coloring pigment, and 0.5-10% of an uncured, heat-convertible resin binder selected from the group consisting of the drying oil-modified alkyd resins, organic solvent-soluble amide-aldehyde resins, and mixtures thereof; 0.25-4.0% of a water-soluble soap of a fatty acid; and 0.3-2.0% of a halogenated phenol mildewproofing agent dissolved in a water-soluble sulfonated oil. All percentages are based on the weight of the total emulsion. E.G.S.

TRANSPARENT CONTAINERS

SHUMANN, HAROLD F. Display bag and method of making the same. U. S. patent 2,538,920. Filed Nov. 18, 1946. Issued Jan. 23, 1951. 2 claims. [Cl. 229-53]

A display bag for the packaging of nuts, popcorn, and pretzels is formed from heat-sealing cellophane or coated, heat-sealable glassine sheet material. 5 figures. E.G.S.

VANILLIN

MARSHALL, HARRY B., and SANKEY, CHARLES A. Methods of producing vanillin. Canadian patent 470,915. Filed July 9, 1945. Issued Jan. 16, 1951. 5 claims. Assigned to The Ontario Paper Company, Limited.

This is the same as U. S. patent 2,516,827; *cf.* B.I.P.C. 20: 932. E.G.S.

MARSHALL, HARRY B., and SANKEY, CHARLES A. Methods of pulping ligno-cellulose materials and simultaneously producing oxidation products therefrom. Canadian patent 470,916. Filed July 26, 1946. Issued Jan. 16, 1951. 10 claims. Assigned to The Ontario Paper Company, Limited.

A process for the pulping of wood chips (e.g., spruce or poplar) and the simultaneous production of oxidation products, including vanillin, comprises the steps of subjecting a mixture of the chips and an alkaline cooking liquor to the action of a finely dispersed gas containing free oxygen at 150-200°C. under a pressure in excess of 50 p.s.i., separating the liquid portion of the resultant mixture from the solid residue, and extracting the oxidation products from the liquor. 1 figure. E.G.S.

WET STRENGTH

HECKEL, HERMAN C. N., and SALISBURY, ARTHUR C. Process of making high wet strength paper. U. S. patent 2,536,285. Filed July 25, 1946. Issued Jan. 2, 1951. 9 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 8-116]

A process for imparting wet-strength properties to paper without materially decreasing the dry strength, porosity, or softness of the paper comprises the steps of exposing a paper web or sheet to nitrogen dioxide; removing mechanically held nitrogen dioxide from the paper; and washing the paper in water until it is free of acid. The time of exposure of the paper to nitrogen dioxide is limited in relation to the concentration of nitrogen dioxide used to such a degree that the carboxyl content of the cellulose in the paper is less than 1%, and the nitrogen content of the cellulose is less than 0.2%. 3 figures. E.G.S.

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